REPORT OF THE ACCOBAMS WORKSHOP ON CETACEAN CRITICAL HABITATS (CCH) PROCESS

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10–11 March 2022, Monaco
Léa DAVID

In November 2021 for the 14th Scientific Committee, the Task Manager on Marine Protected Areas presented ACCOBAMS-SC14/2021/**Doc35,** describing the designation of new Cetacean Critical Habitats and case studies on (i) large cetacean species *versus* large commercial vessels, on one hand, and (ii) small delphinids *versus* fishery activities, on the other.

A dedicated workshop was then planned in 2022, in order to enable the development of a final approach, an updated technical process and criteria for proposing areas as CCH to the Parties.

The Scientific Committee agreed on the added value of such workshop and a Steering Committee was created to support this event and work on CCH and a Terms of Reference was written and agreed among the Scientific Committee as followed.

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I. TERMS OF REFERENCE FOR A WORKSHOP ON CETACEAN CRITICAL HABITATS

Background information

According to the ACCOBAMS Conservation Plan (Annex 2 of the Agreement), Parties shall endeavour to establish and manage specially protected areas corresponding to the areas which serve as habitat of cetaceans. The concept of Cetacean Critical Habitat logically includes a combination of cetacean occurrence and/or favourable habitat and actual and/or potential threats that may result in problems at the population level. The ACCOBAMS Scientific Committee had already identified a number of important areas for cetaceans in the region in 2010 e.g., see the Annex to Resolution 4.15, but those need urgently to be updated in the light of new available knowledge. The Resolution has also indicated that an important tool to achieve good conservation status for cetaceans in the region is the creation of a network of effective - with targeted and fully implemented conservation measures - marine protected areas (MPAs). ACCOBAMS is also working on the development of conservation and management actions in the context of Conservation Management Plans (CMPs, SC14.Docs 15-18). Given data at an appropriate geographical and temporal scale are available, spatial mapping (e.g., see progress with NETCCOBAMS, SC14.Doc 36) is an important tool in identifying critical habitats for cetaceans known as CCHs (e.g., see Resolution 6.24) by incorporating data on both cetaceans and potential threats.

Since that Resolution, the Scientific Committee has received progress reports on work to develop updated CCHs (SC14.Doc35) and has also received the results of the ACCOBAMS Survey Initiative and a subsequent workshop examining the management and conservation implications (SC14.Inf03).

Both MOP Resolutions also highlighted the importance of a collaborative approach with other relevant bodies including the Pelagos Sanctuary, GFCM, IUCN-Med, UNEP/MAP through SPA/RAC, Black Sea Commission and in collaboration with MedPAN.

CCH are meant to provide a synoptic view of areas under various threats, actual or potential, within the whole agreement area. Once the CCH 'envelopes' are completed, the next step is to suggest effective conservation measures on a case-by-case basis. This will require a more focussed analysis by appropriate experts in consultation with stakeholders at the appropriate geographic scale.

The CCH process is linked and complementary with several other ACCOBAMS initiatives, including CMPs, ASI

recommendations and other large-scale initiatives: e.g., IMMAs, EU Marine Spatial Planning, EBSAs, etc.

This workshop is intended to allow a full review of progress and what work remains for wider circulation, first to the Scientific Committee and ultimately to the Parties.

Objectives of the Expert Workshop

(1) Review the complementarity and synergy of the ongoing work and processes for identifying CCHs in light of:

      (a) the work on IMMAs:

      (b) the results and implication of the ASI and the subsequent workshop;

      (c) the work on NETCCOBAMS;

      (d) work on CMPs.

(2) Review and update as necessary the "expert knowledge" GIS database (workshop held in 2017 at the 31st ECS Conference "Inputs to the ACCOBAMS ongoing effort to map human threats on cetaceans in the Mediterranean and Black Seas") on actual or potential threats (distribution and intensity). This will include comparing the results of the "expert knowledge" with existing mapping exercises of both cetacean occurrence (distribution and density) and threats (e.g. NETCCOBAMS) including any seasonal changes.

(3) Examine how to incorporate uncertainty (including consideration of appropriate temporal and geographical scales) into spatial mapping tools including NETCCOBAMS and the need to make uncertainty levels clear to managers and others.

(4) Develop and agree on a final approach, updating process and criteria for proposing areas as CCH to the Parties.

(5) Structure the process (framework, guide, roadmap…) to identify tools for 'adequate' management of areas within CCH.

Steering Group

David L. (Chair), Panigada S., Donovan G., Gonzalvo J., Secretariat for logistics,

The primary task of the Steering Group (in conjunction with the Secretariat as necessary is to (a) finalise the agenda based upon the above objectives, (b) identify documents needed (existing or requests for new documents), (c) finalise the agenda and identify the participants, ensuring that the required expertise is obtained.

Expertise required

In addition to those familiar with the work undertaken in the CCH process thus far and NETCCOBAMS, the workshop will require people inter alia with expertise/knowledge in one or more of: (a) spatial modelling; (b) temporal and spatial cetacean distribution; (c) the IMMA process and results for the Mediterranean; (d) pressures and potential threats (and available data and interpretation) such as shipping, fishing, other 'noisy' activities including seismic surveys; (e) the CMP process in the Mediterranean; (f) representatives of the managers of Pelagos and other marine protected areas within the ACCOBAMS region. It will be helpful to make use of the expertise present at the CMP workshop.

II.   List of participants

Name	Country	Affiliation
Simone Panigada	ITALY	ACCOBAMS Scientific Committee
Joan Gonzalvo	SPAIN	ACCOBAMS Scientific Committee
Greg Donovan	UK	Task Manager CMP, ACCOBAMS Scientific Committee
Lea David	FRANCE	ACCOBAMS Scientific Committee
Caterina Fortuna	ITALY	ISPRA
Pauline Gauffier	PORTUGAL	Madeira Whale Museum
Tilen Genov	SLOVENIA	Morigenos
Antonella Arcangeli	ITALY	ISPRA
Otero del Mare	SPAIN	IUCN MED
Alessio Maglio	FRANCE	SINAY (NETCCOBAMS, noise)
Reda Neveu	FRANCE	MedPAN
Mike Tetley	UK	IUCN Joint SSC/WCPA Marine Mammal Protected Areas Task Force
Aurélie Moulin	ITALY	CIMA (NETCCOBAMS and WW)
Julie Belmont	-	ACCOBAMS Secretariat
Susana Salvador	-	ACCOBAMS Secretariat
Maylis Salivas	-	ACCOBAMS Secretariat

III. AGENDA

Thursday 10th March 2022
9h00- 10h30 Welcome and introduction to the workshop

Welcome to all participants	Susana SALVADOR
Round table	All participants
Background about the ACCOBAMS CCH initiative	Maÿlis SALIVAS
CCH process up to date	Léa DAVID
Objectives of the workshop	Léa DAVID

10h30- 11h00: Coffee break
Review the complementarity and synergy

With IMMA (5')	Simone Panigada
With ASI and subsequent workshop on conservation (5')	Julie Belmont
With the work on NETCCOBAMS (5')	Alessio Maglio
With the work on CMPs (5')	Greg Donovan
With MedPan (5')	Reda Neveu

Discussion in plenary

13h00- 14h30: lunch break
14h30- 16h30   GIS layer of "expert's knowledge"

The "expert's knowledge" database, presentation	Léa David
Review and updates received from experts	Léa David

Comparison with mapping exercise for cetacean and discussion

16h30- 17h00: Coffee break

17h00- 18h30 Human activities: validation of the choice of existing maps and database	• Fishery • Maritime traffic, AIS • Other potential income: WW

Friday 11th March 2022
9:00-10:30   Examine limitations and uncertainty

Examine how to incorporate uncertainty (including consideration of appropriate temporal and geographical scales) into spatial mapping tools including NETCCOBAMS and the need to make uncertainty levels clear to managers and others	Léa David + All participants

10h30- 11h00: Coffee break	
11:00-13:00 Develop and agree on a final approach, updating process and criteria for proposing areas as CCH to the Parties (discussion about GIS operation, rules for delineation of areas, methodology behind some spatial choices for mapping, etc).	Léa David + All participants
13h00- 14h30: lunch break	
14h30- 16h30 Structure the process (framework, guide, roadmap…) to identify tools for 'adequate' management of areas within CCH.	Maÿlis Salivas
16h30- 17h00: Coffee break	
17h00- 18h30 Conclusions and recommendations of the workshop	Léa David & Maÿlis Salivas

IV.   Outcome of the workshop: Technical Progress report for the CCH process – Ongoing

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Aim

Cetacean Critical Habitat = maps of potential exposure level of cetacean's Habitat to the various anthropogenic pressures

The CCH is a science-based process whose results will be displayed on a free accessible web-based GIS, Netccobams, and be useful for communication with stakeholders and decision makers at the regional level, as an interface between science and policies

Where the threat is known, the CCH will be the area where to focus to find the relevant measures of mitigation, from place-based to sectorial-based and act.

It is complementary to national analysis and initiatives of any science, management and measures of conservation

Limits

CCH = still an on-going process that has to be fed by new results when they become available.

Exercise needing precise quantitative geographic data from different reliable sources, at the regional level, merging them, and then simplifying it through a generalisation of the shapes (degrading information) to highlight the main areas where the cetaceans are threatened in their habitat.

CCH is not a Marine Protected Area.

List of data providers used for CCH process

Model of cetacean habitat:

- ACCOBAMS, ASI & CeNoBS
- Duke University Marine Geospatial Ecology Lab, Durham, North Carolina

IMMA:

- IUCN Marine Mammal Protected Area Task Force

Human activity data:

- SINAY
- Global Fishing Watch
- ACCOBAMS
- Halpern *et al*. 2008

ACCOBOBAMS TECHNICAL PROGRESS REPORT FOR THE CCH PROCESS
SUMMARY

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1 Introduction

According to the ACCOBAMS Conservation Plan (Annex 2 of the Agreement), Parties shall endeavour to establish and manage specially protected areas corresponding to the areas which serve as habitat of cetaceans. **The concept of Cetacean Critical Habitat logically includes a combination of cetacean occurrence and/or favourable habitat and actual and/or potential threats that may result in problems at the population level.** The ACCOBAMS Scientific Committee and Parties have already identified a number of important areas for cetaceans in the region in 2010 e.g., see the Annex to Resolution 4.15, but those need urgently to be updated in the light of new available knowledge.

- **Definition**

Cetacean Critical Habitat (CCH) refers to those parts of a **cetacean's range** that are **essential** for day-to-day well-being and survival, as well as for maintaining a healthy population growth rate" (Hoyt 2011).

- ✔ Areas used by cetaceans for feeding, breeding, calving, nursing and social behaviour;
- ✔ Migration routes and corridors and related resting areas;
- ✔ Areas where there are seasonal concentrations of cetacean species;
- ✔ ………

It also incorporates the concept of actual human activities and/or potential threats at the (sub)population level, focusing on some of the most relevant "direct threats," such as:

Human activity or PRESSURE	Threat
Large commercial vessels (cargo, ferries, tanker…)	Ship strike, continuous noise
Fisheries	Bycatch, depredation
Whale-watching	Disturbance, Harassment
Recreational vessels	Disturbance, Harassment
Oil&Gas activity, coastal building, etc	"Hot-spots" of impulsive noise

The final aim is to identify, for each CCH, suitable management measures (place-based, sectoral based) for an effective conservation of cetacean species.

- **The CCH aims are:**

⇒ Build a collaborative **science-based process with feedback validation**

⇒ Build an **official communication tool** toward Parties and stakeholders, an **interface between science and policy**

⇒ Build **a support** to help in identifying **where and what threaten cetaceans at regional level, a synoptic vision**

⇒ To be used to **identify suitable management measures** (place-based, sectoral based) for an effective conservation of cetacean species

⇒ **Launch at regional level, the implementation** of management and conservation measures, **complementary to any national initiatives**

- **What is a CCH ?**

- An area showing at least the co-occurrence of species and pressures

- An area of general risk exposure (ref: ISO31000; Werner et al., 2016)

- With levels of confidence (based on expert's knowledge about the threats and impacts in their areas)

- An area where management and measures of conservation should be implemented

- **The CCH Process and updates**

⇒ In order to define CCH, the aim was to build a clear and objective process using GIS tools and agreed rules, that are transparent and reproducible for the updates. It is not intended first to be a scientific study from raw data but a process using best existing results from the scientific community. The CCH process is an ongoing process that may be updated every 3 years, or before if a particular event happens.

- **Availability of the CCH outputs**

The different agreed layers used during the CCH process will be uploaded on the NETCCOBAMS platform GIS page, made visible and also available through a specific request form and with feedback/keep track on its use. The requests will be reviewed following the rules defined by the Scientific committee.

# 2 Geographic and temporal scales

As the CCH is an ACCOBAMS initiative, the geographical scale is the entire Mediterranean Sea and the Black Sea. Both seas will probably be treated separately, but the process will be the same.

Considering temporality, the best period would be the season. This has to be tried when data are available at this scale. If not, then the year will be used.
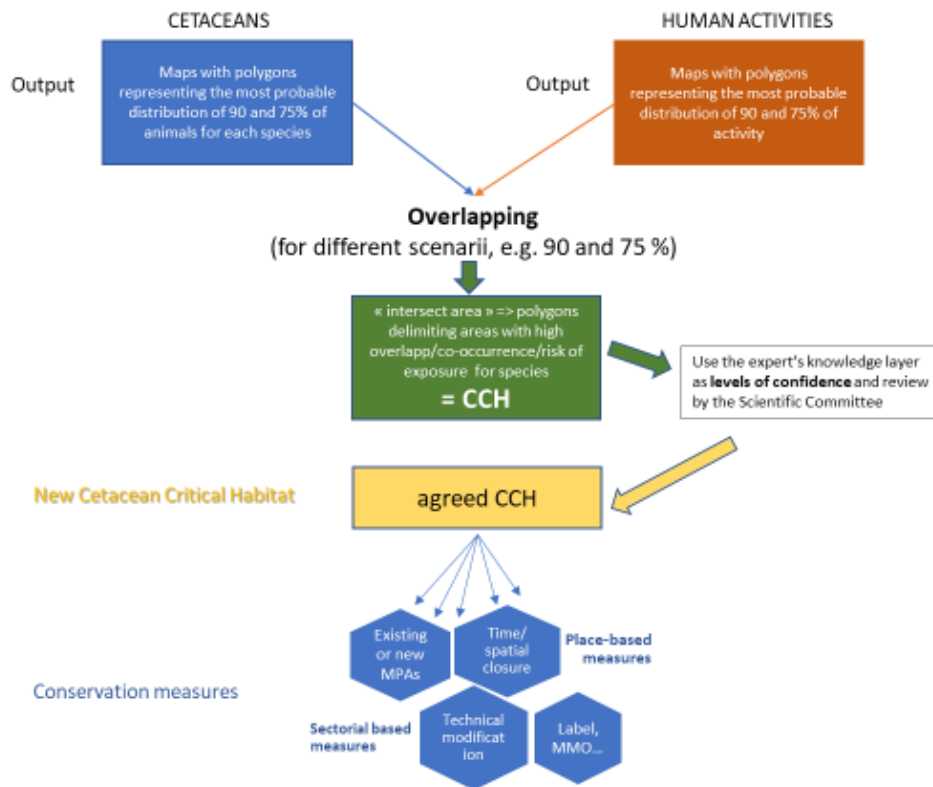
3 Summary of the global CCH process

Improvements in the Cetacean Critical Habitat process and method is described schematically in these figures and is explained in more details in this report.

First step:
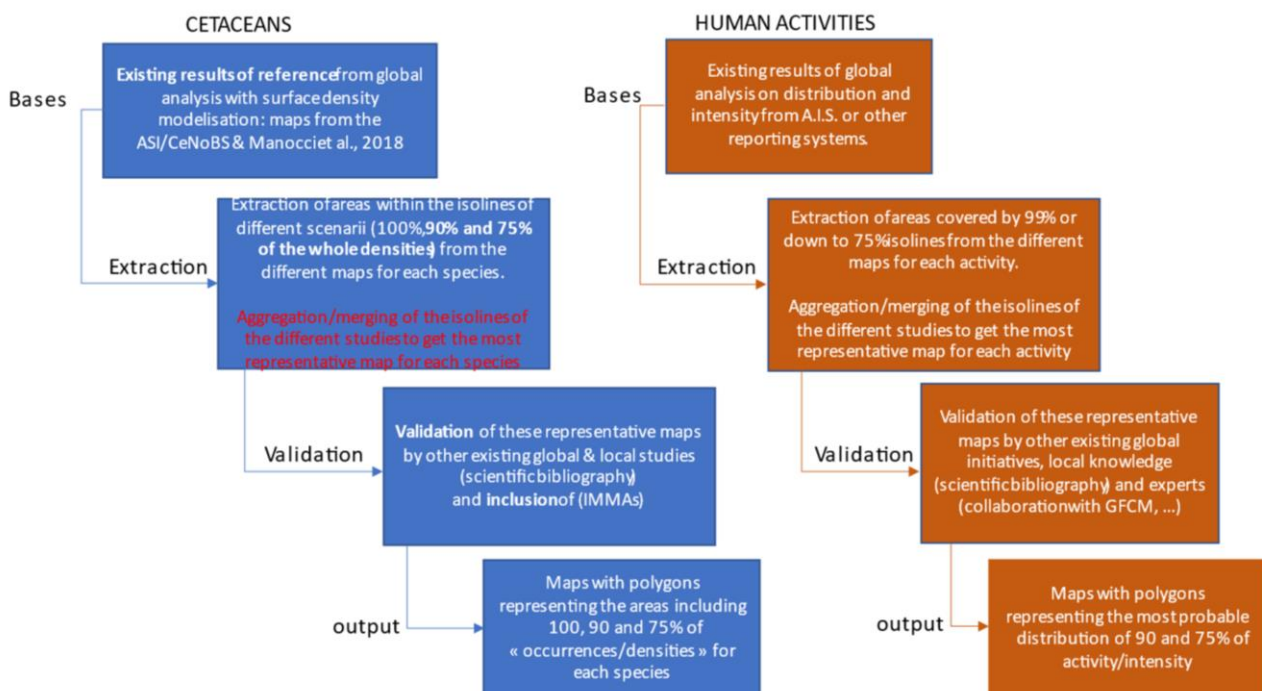
Second step:

4 Cetacean data input and process

4.1 Cetacean input data

The bases are the existing "synthetic" studies/**analyses** that used a lot of existing data, for a large temporal and spatial coverage: the ACCOBAMS Survey Initiative or ASI and the Gap Analysis led by the Duke Marine Lab. in 2016-2018. The results of these studies were surface density modelling maps for species.

4.1.1 ACCOBAMS Survey Initiative (ASI)

The results come from the ACCOBAMS Survey Initiative undertaken in the Mediterranean Sea (ACCOBAMS (a), 2021) and from the ASI/CENOBS/EMBLAS carried out in the Black Sea (ACCOBAMS (b), 2021). Target species are the fin whale, the striped dolphin, the Risso's dolphin, the common dolphin, the bottlenose dolphin, and the harbour porpoise. There are no existing maps for the sperm whale, the long-finned pilot whale nor the Cuvier's beaked whale.

Surface density modelling outputs were maps of densities expressed as the number of individuals per cell of 100 km². Data have been collected during summer 2018 within the Mediterranean Sea and during summer 2019 for the Black Sea. Modelling has been realized only on data from aerial surveys. The maps of the predicted abundances of each species from the ACCOBAMS Survey Initiative are presented on Appendices

4.1.2 Gap Analysis and spatial models of marine species

A global Gap Analysis study was run by Mannocci and colleagues, based on gathered data, boat- or aerial based, from almost all teams working on cetaceans within the Mediterranean Sea from 1999 to 2016 (Mannocci *et al.,* 2018). Following this, the team developed marine species density models. Target species with enough data were the sperm

whale, the fin whale, the Cuvier's beaked whale, the bottlenose dolphin, the striped dolphin, the long-finned pilot whale, the Risso's dolphin and the common dolphin.

Surface density modelling outputs were maps of densities expressed as the annual mean of individuals per 25km². The selected covariates for the final model and the associated maps of mean annual predicted densities for each species are presented on Appendices

4.2   Creation of the "species" polygons of reference

When the information was available in files with format as .tiff or raster or .shp, they were included in the Geographic Information System or GIS (QGis, version 3.16.6) project directly. For raster files, an extraction by contour has been realised, to get the delineated areas excluding the 10% very low values and the 25% lower values. So, a polygon including the cells with the 90% remaining values of densities, and another with 75%, have been extracted and used.

Figure 1 details the different steps under QGis for the creation of the "species" polygons for the CCH process, an illustrated example of the procedure is visible in the Appendix 2.
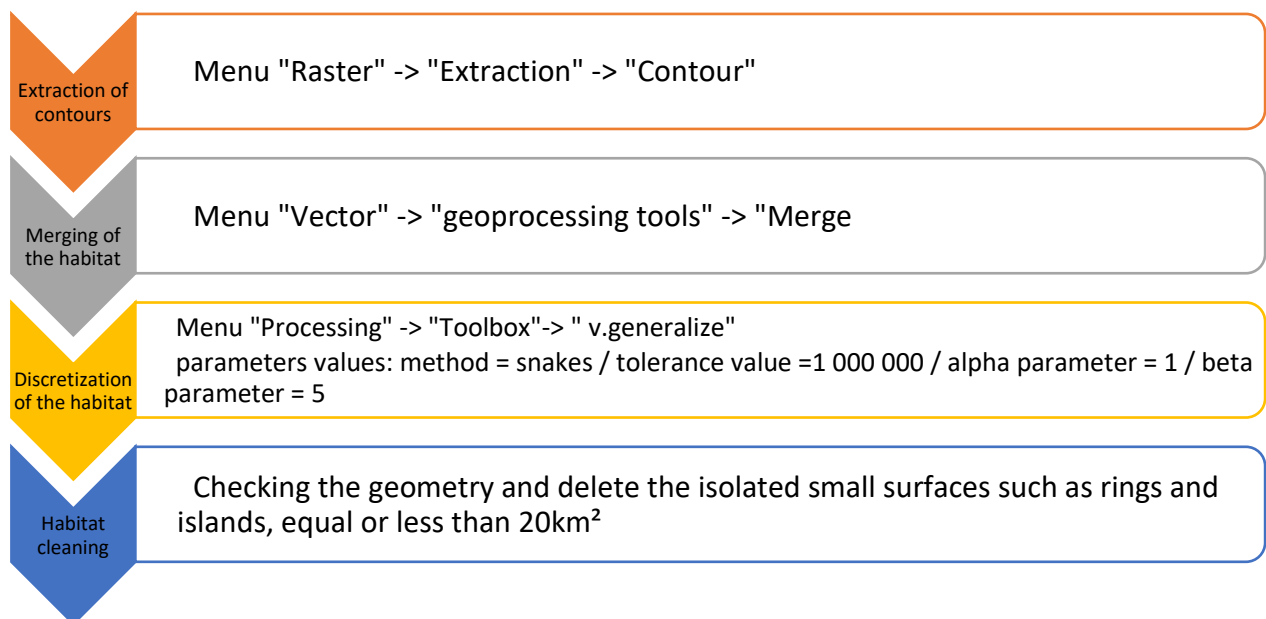

Extraction of contours	Menu "Raster" -> "Extraction" -> "Contour"
Merging of the habitat	Menu "Vector" -> "geoprocessing tools" -> "Merge"
Discretization of the habitat	Menu "Processing" -> "Toolbox"-> " v.generalize" parameters values: method = snakes / tolerance value =1 000 000 / alpha parameter = 1 / beta parameter = 5
Habitat cleaning	Checking the geometry and delete the isolated small surfaces such as rings and islands, equal or less than 20km²

Figure 1: Procedure under QGis

4.3   "Validation" process

As the data used by Mannocci and colleagues and data coming from the ASI&CeNoBS may have some temporal or spatial gaps, the polygons resulting from the CCH process explained before were then for each species compared to other maps resulting from other studies led at the sub-regional or regional scale. If maps were coherent, highlighting the same important areas for the species, then it "validates" the map of species for the following steps in the CCH process to be used. If it was not coherent in some areas (missing areas mainly), a more review process begins in order to know if the area has to be added or not, and if yes, then the results of the other study were used to fill the gap in the CCH species map. Scientific results as well as expert's knowledge were considered for this step.

Table 1 shows the list of the main publications consulted for the different species.

Table 1: Main publications of reference used according to species

	Fin whale	Sperm whale	Bottlenose dolphin	Common dolphin	Striped dolphin	Risso's dolphin	Long-finned pilot whale	Cuvier's Beaked whale	Harbour porpoise
IMMAs	x	x	x	x	x	x	x	x	x
Arcangeli et al. 2019						x	x	x	
Bearzi et al. 2003				x					
Birkun et al. 2014			x	x					x
Cañadas et al. 2016								x	
Druon et al. 2012	x								
Lewis et al. 2018		x							
Notarbartolo di Sciara et al. 2016	x	x						x	x
Sánchez-Cabanes et al. 2017			x	x					x
Vella et al. 2021				x					

Examples of resulting maps from the CCH process, for the sperm whale (Figure 2), the fin whale (Figure 3), the bottlenose dolphin (Figure 4) are presented and are in accordance with those from the literature.

However, for the common dolphin and the harbour porpoise, the obtained results do not reflect all the known suitable habitats. To overcome this lack, it was chosen to add the IMMAs regarding each species (Appendix 3). Indeed, the IMMAs represent important areas for cetaceans and have been validated according to specific criteria based on scientific results (IUCN MMPATF, 2016).

Example of draft maps that can be obtained for species (Figure 2, Figure 3, Figure 4) three species (validation process is still ongoing).
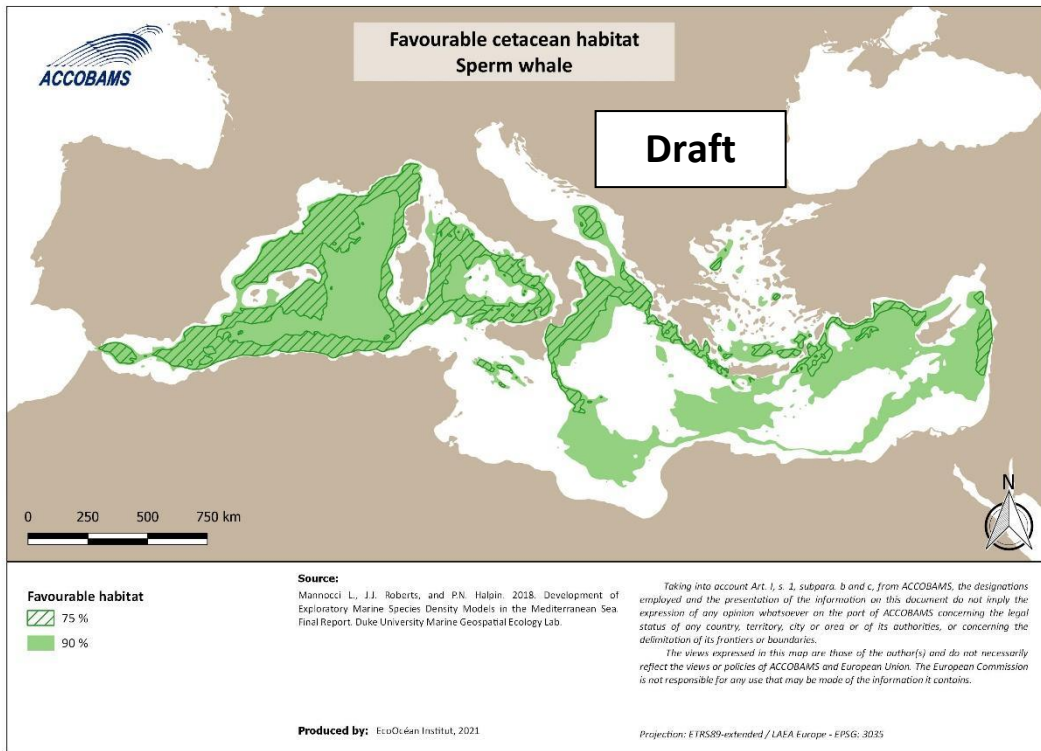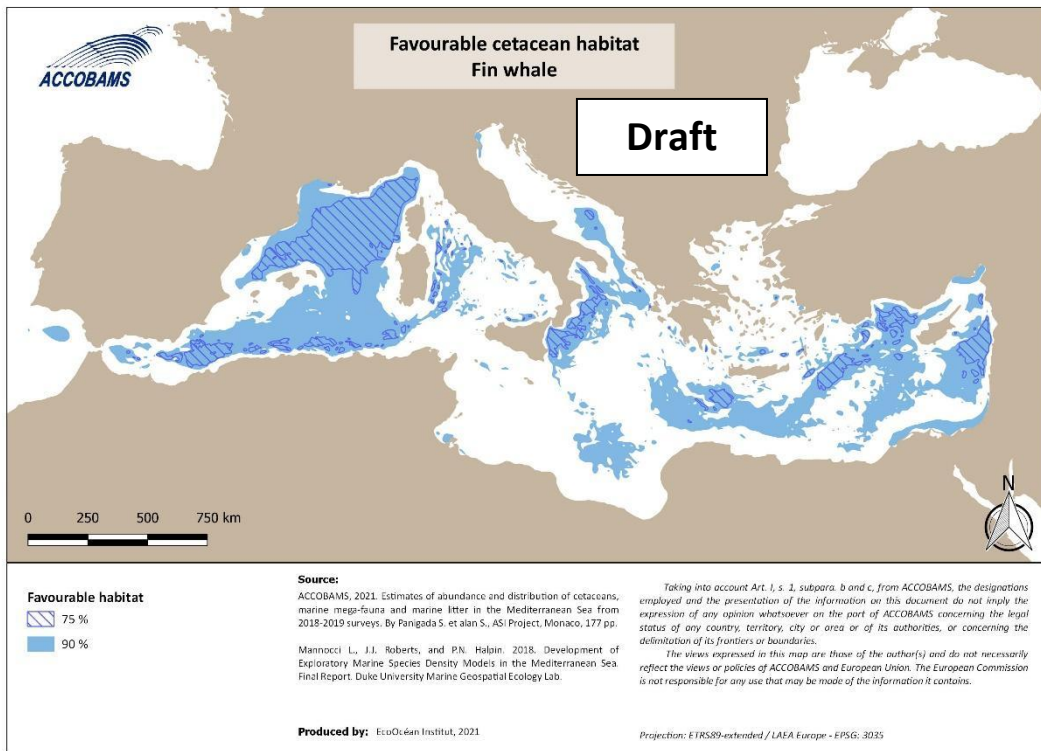
Figure 2: Favourable habitat for the sperm whale (draft)
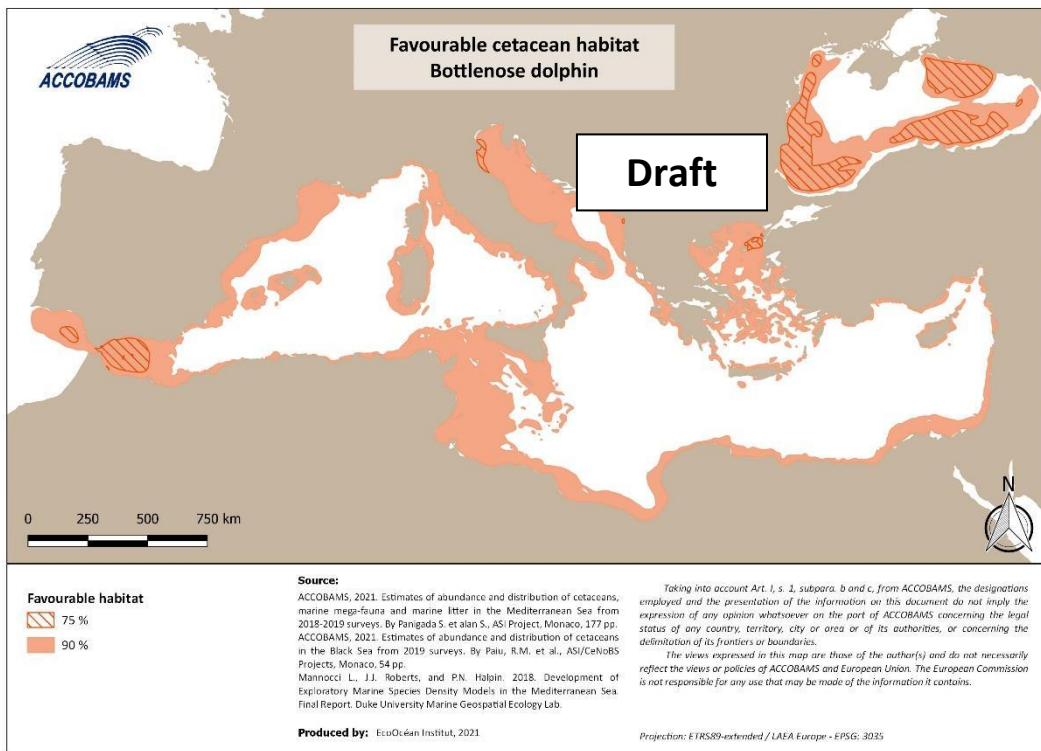

Figure 3: Favourable habitat for the fin whale (draft)

Figure 4: Favourable habitat for the bottlenose dolphin (draft)
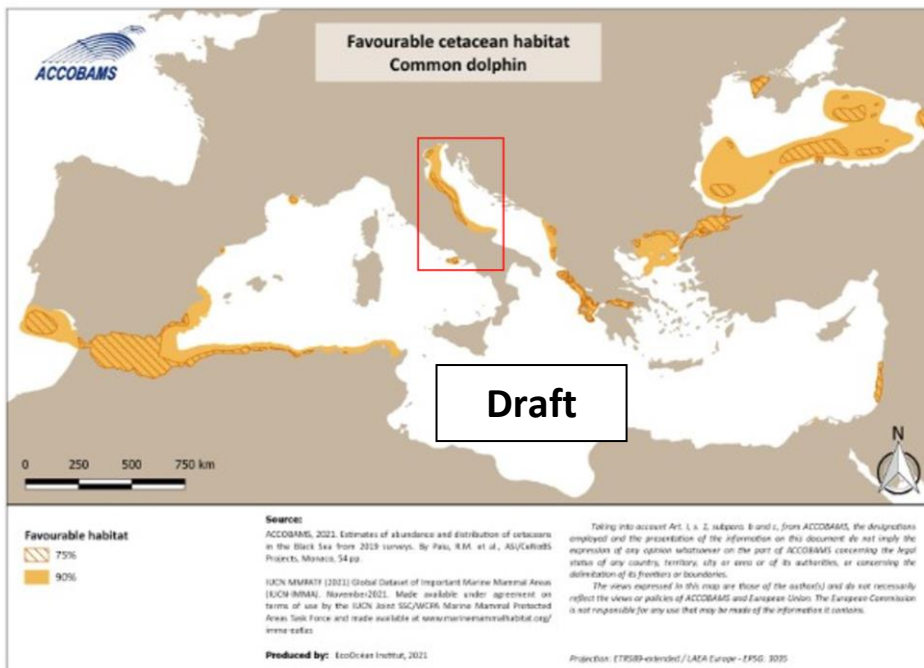
Figure 5: Favourable habitat for the common dolphin

The aggregation and merging of different types of maps, even if the metrics are the same (densities) and the analysis too (surface density modelling), could pose some questions. Also, there is some consideration that some areas were not covered with line transects or only recently. Knowing that the Duke Marine Lab is launching a new wide analysis of surface density modelisation for the Mediterranean Sea and also the Black sea right now, that the outputs will be available early 2024, and that they intend to gather as many existing datasets as possible enlarging the type considered (small boat, ferries, aerial) and the method (distance sampling, in effort, line transect…), it seems obvious to wait until

their outputs come. The task manager and Steering Committee of the CCH process will be in touch with the Duke Marine Lab in order to get all the information necessary: uncertainties, effort coverage for the spatial confidence, modelisation with average and lower and upper boundaries as scenarios to consider, seasonal maps when possible, etc. In the meantime, participation by all providers of data to the Duke Marine Lab. initiative is strongly recommended.

In the future, all maps will include the information regarding the level of confidence for the species, mainly based on the existing effort coverage in the area, as: High confidence / Medium confidence / Low confidence / Unknown. This effort coverage will be provided by the Duke Marine Lab. upcoming work and also based on existing literature.

If an area is highlighted by the mapping exercise, and if there is a high level of effort coverage but no sightings of the species, then the area will be deleted for the species (ex: common dolphin in the Adriatic Sea)

Moreover, if an area known as feeding ground for a species but not highlighted by the surface density modelling analysis, as the known seasonal feeding ground of fin whale around Lampedusa Island or in the canyons of the Gulf of Lion and offshore Barcelona coasts in spring, they will be added to the map.

5 Data on human activities and process

5.1 Marine Traffic (large commercial vessel)

5.1.1 Marine traffic input data

The marine traffic of large commercial vessels is monitored at sea with a mandatory tool, the Automatic Information System (AIS) and each vessel over a specific tonnage around the world is equipped with AIS. Maps were built based on AIS data from the whole 2018 year.

The grid resolution is 0.1x0.1; and the unit corresponds to the number of AIS messages emitted over the grid surface during the study period. Analysis and compilation of AIS data have been realized by SINAY. The category of large commercial vessels includes cargos, tankers, container ships, ferries, cruise vessels...

A first improvement could be to exclude the A.I.S points of vessels at anchor. A second one could be to use a different metric, as hours/gris cells or even use an analysis that reconstructs the trajectories of each vessel from its emitted points, in order to fill the gap in areas where low transmission could have a bias for the mapping exercise.

A working group will be created in order to fix the best metrics to use, the analysis to lead and also the sources of data to consider (cost, availability, reliability, update frequency…ex:EmodNet), in collaboration with experts on maritime traffic data.

5.1.2 Marine traffic polygons

The same method as for the cetacean polygon process has been applied: contour extraction / discretization / cleaning. At the end, isopleth 75% and isopleth 90 % of the annual traffic in the Mediterranean Sea are displayed respectively on Figure 6 and Figure 7. This exercise can also be done per speed categories, per type of vessel if needed.
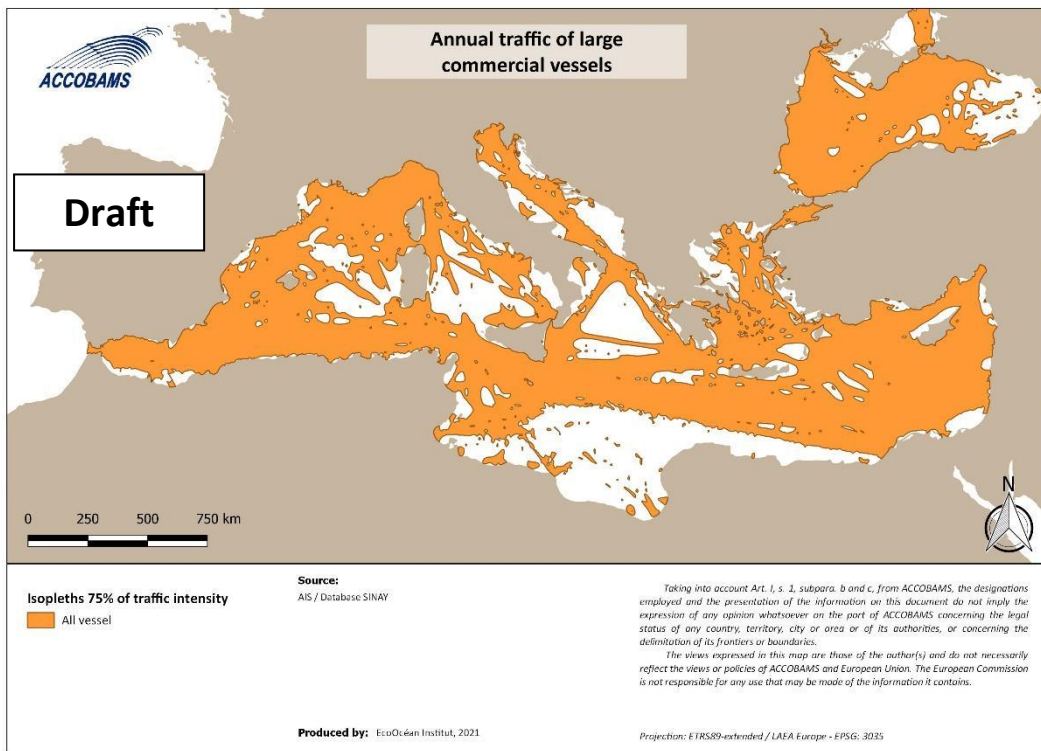
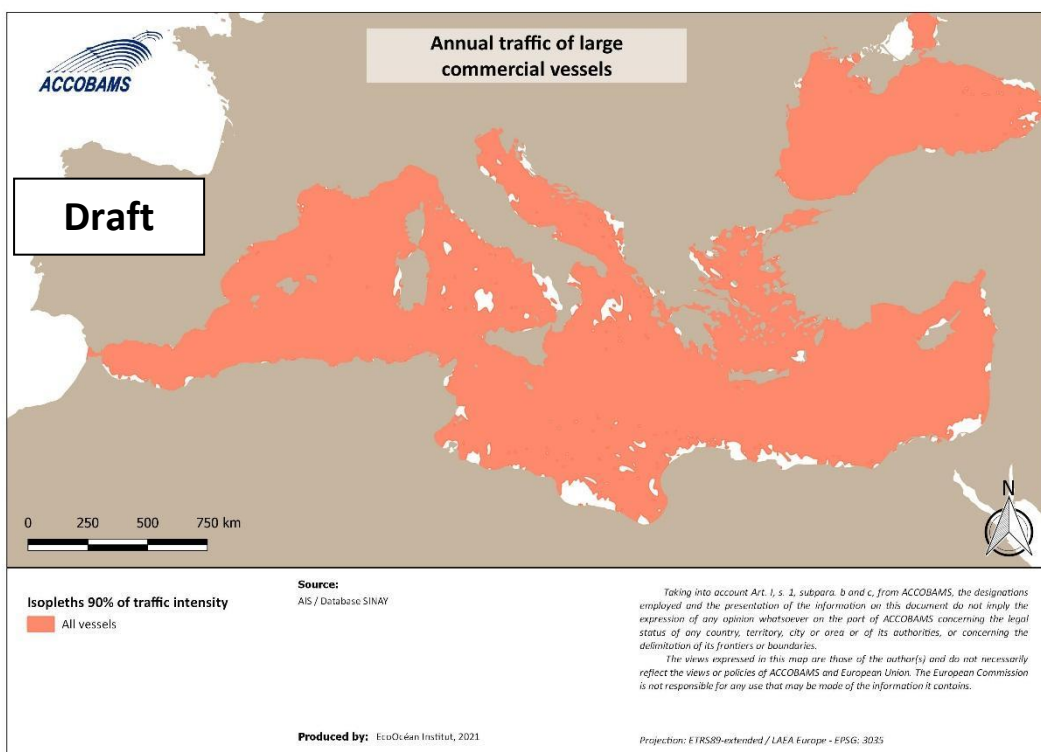*Figure 6: example of marine traffic polygon (Isopleth 75%)*

Figure 7: example of marine traffic polygon (Isopleth 90%)

5.1.3 "Validation"

The annual density map of marine traffic displayed on the web site https://www.marinetraffic.com/ has been used to validate or complete the information regarding the maritime traffic, as well as the Medtrends work (Piante and Ody, 2015).

5.2   Fishery

The fishery activity at sea is not easy to map. Indeed, some tools to follow each vessel at sea exist, such as the AIS, but this tool is mandatory for European vessels only, and for vessels larger than 12 m only. Therefore, as the fishery fleet in the Mediterranean Sea consists of 83% of small-scale vessels (Figure 8, FAO, 2020), without AIS, those ones are not monitored at sea. Large vessels from non-European countries are not traceable at sea either. Another way to manage fishery vessels at sea mostly in European countries is the VMS tool. But those data are not easily available for most of the countries and where AIS exists, it does not bring much more than the easily accessible AIS.
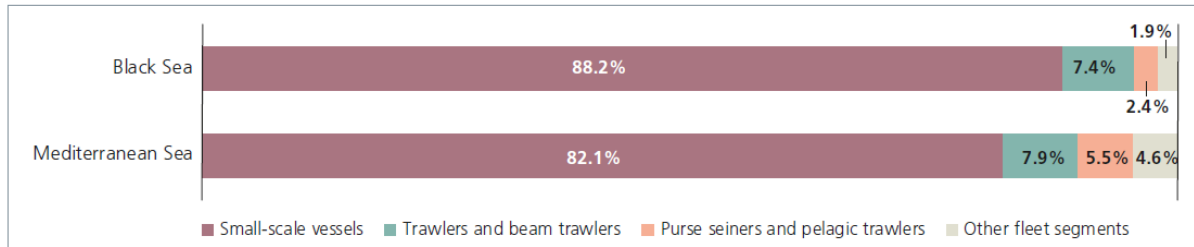
Figure 8 : Fleet segment composition in the Mediterranean and Black Sea, FAO 2020

5.2.1   Fishery input data

Data on fishery activities come from the AIS results from the Global Fishing Watch website[1], free of access, and consists of a compilation of daily hours of fishing during the year 2018 in a grid of 0.1x0.1° cells.

Global Fishing Watch analyzes AIS data collected from vessels identified as known or possible commercial fishing vessels, and applies a fishing detection algorithm to determine "apparent fishing activity" based on changes in vessel speed and direction. The algorithm classifies each AIS broadcast data point for these vessels as either apparently fishing or not fishing and shows the former on the Global Fishing Watch fishing activity heat map.

Vessels are divided into 5 categories:
- drifting longlines
- seiners: vessels using seine nets, including potential purse seine vessels, targeting tuna and other species, as well as danish and other seines
- trawlers: all types
- fixed gear: a category that includes potential set longlines, set gillnets, and pots and traps
- all fishing

5.2.2   Fishery Polygons

The same method as for the cetacean data process has been applied to obtain the polygon of this activity: contour extraction / discretization / cleaning. However, because the activity exploits the sea in a dynamic way, not going each time exactly in the same place, it appears that the intensity expressed in those small cells seemed not the best parameter to represent this activity spatially. Indeed, the 75% of effort highlighted really very small areas, and mapping outcomes appear really not representative of this activity at sea. (Appendix 4). So, it was decided to keep almost the 99% effort.

5.2.3   Validation

Several works about spatialisation of fishery activities exist based on AIS e.g.:

- Piante & Ody, 2015.

- Vespe et al., 2016

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[1] *https://globalfishingwatch.org/map/*

Their comparison shows that the maps obtained are all almost the same.

Nevertheless, in order to take into account also the artisanal fleet, the layer produced through modelisation by Halpern et al. (2008) of this activity in the Mediterranean Sea and Black Sea, was downloaded and added to the map of this pressure. And considering the data collected during the ACCOBAMS Survey Initiative on fishery vessels and the results obtained from those data by David & Roul (2021), it appears important to think about using those results (kernel analysis) to fill some gaps in the pressure map too. Then, the final map could merge the polygons of the three sources as shown in Figure 9.
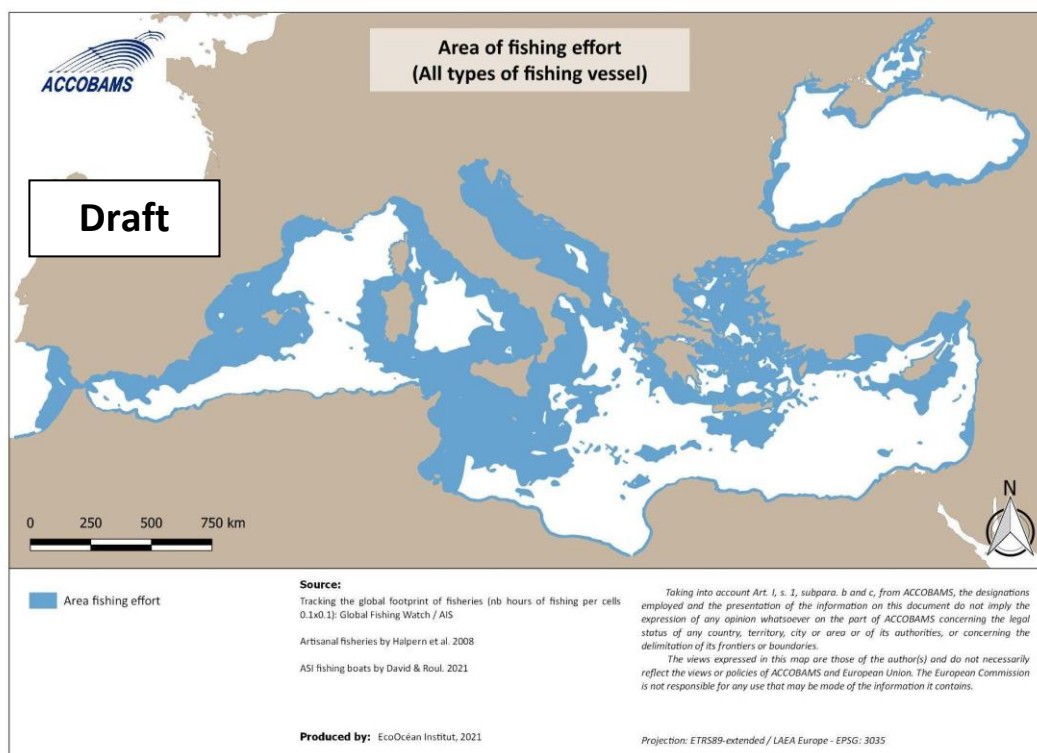
Figure 9: Area of annual fishing effort in the Mediterranean Sea and the Black Sea (draft)

A working group will be created in order to determine which metrics, analysis and sources of data to consider (cost, availability, reliability, update frequency…), in collaboration with fishery experts (GFCM experts, IWC). It may be common with the WG on AIS for maritime traffic.

Another interesting way of mapping or "validating" areas, would be to use data collected at sea from different sources. Several ACCOBAMS partners or global initiatives (ASI, SAMM, FLT) collect data on human activities and those could be used.

5.3   Whale watching

Existing maps of the whale-watching pressure at sea exist, but locally in France (Mayol *et al.*, 2012) or in Italy (Sicomar project). The project of mapping this activity at the ACCOBAMS scale is ongoing, in link with the ACCOBAMS working group on Whale-watching.

5.3.1   Whale watching input data

The ideal is to use data recorded directly from observers onboard or owners of the Whale-watching vessels during their trips. As this does not exist at the regional scale, it is planned to model simply the answers coming from the questionnaire sent by the ACCOBAMS working group on whale-watching (WWWG) and the consultant on that topic to all focal points and experts. The questionnaire requests information on the frequency of trips and the areas usually covered.

5.4 Recreational vessel

No precise map of this activity exists within the ACCOBAMS area.

What is planned is to use or redo the modelling exercise available in Piante & Ody (2015) or Halpern et al. (2008).

For the validation process, the data on human activity from direct observation at sea, like the one collected by the Medtrix aerial surveys along the French Mediterranean coasts (https://medtrix.fr/), will be used.

5.5 Fix and punctual activities: fish farms, oil&gas platforms and seismic exploration

Maps of some fixed activities, such as fish farms and oil&gas platforms may be drawn, based on existing knowledge and official listing and charts as future steps.

Considering more punctual activities, such as seismic exploration or coastal building, it is difficult to map those in the CCH process as they are not permanent. The base of these activities will be taken from Maglio et al., 2016 when it will be updated.

6   Overlap of species and human activities maps, creation of new CCH polygons

6.1   Overlap and intersect

The "species" polygons will be overlapped with the "human activity" polygon through GIS. The resulting overlapping part will define the potential "interaction" areas. Within those interactions are the threats to the species. As first examples, the CCH exercise has been ran on known threats as:

- Marine traffic and large species of cetaceans (fin whale and sperm whale) for ship strike and continuous noise
- Fishery and delphinids (bottlenose dolphin, common dolphin, striped dolphin and harbour porpoise) for depredation and bycatch

But any overlap can be realised, as sperm whale and Risso's dolphin versus fishery, all species versus recreational vessels and whale-watching, and coastal species versus coastal building. Globally the exercise should be done at least at the two levels of 90% (conservational approach) and 75%, and at other levels if needed.

QGis procedure: use the species layer (favourable cetacean habitat) as the first layer, then the pressure layer (human activity) as the overlay layer through the tool "Vector" -> "Geoprocessing Tools" -> "Intersect".

The overlap maps with both types of layers still visible, favourable cetacean habitat and annual traffic of human activities as example, are presented on Appendix 5. **The intersecting part of this overlap constitutes the CCH polygon.**

The final maps of example of the CCH are presented below and represent the areas of co-occurrence of species and pressures and even the areas with risk of exposure for the species from a specific human activity (Figure 10, Figure 11).
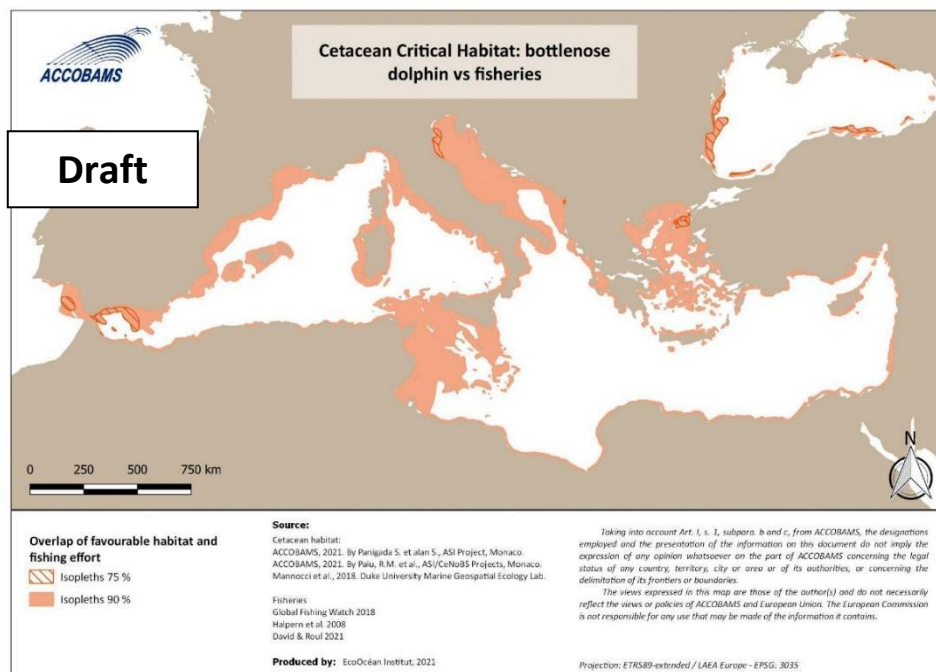

Figure 10: Example of Cetacean Critical Habitat of the bottlenose dolphin versus fishery activities in the Mediterranean and the Black Seas (draft)
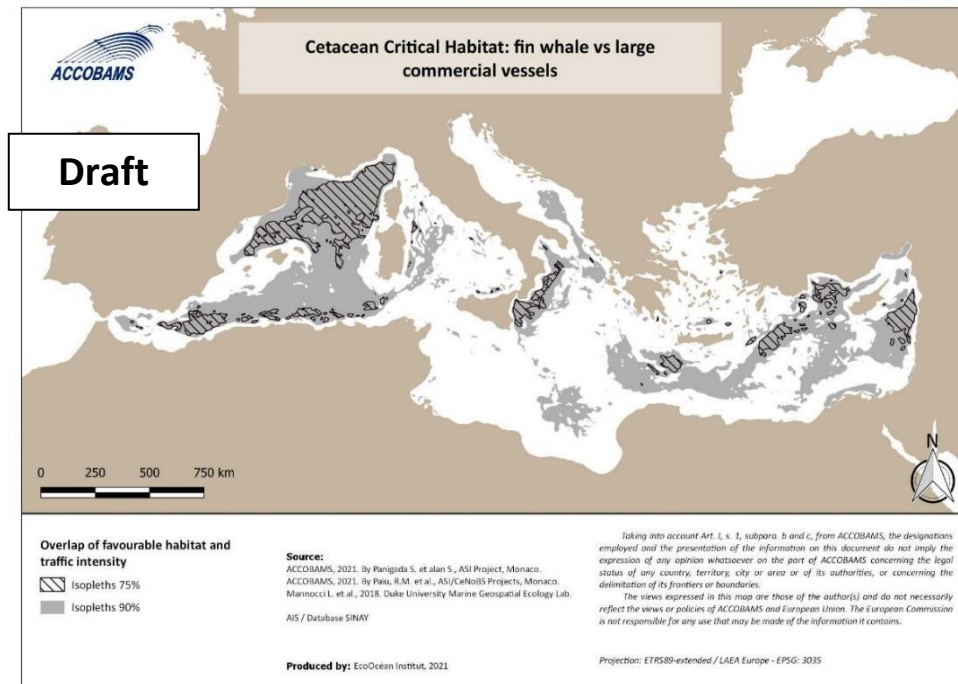
Figure 11: Example of Cetacean Critical Habitat of the fin whale versus marine traffic in the Med. Sea (draft)

6.2   Use of the level of confidence brought by "expert's knowledge" to agree for the proposed new CCH

The expert's knowledge is provided through a questionnaire they fill and associated polygons they send to ACCOBAMS. The questionnaire, guiding document and polygon's rules have been improved from those used for the 2017 workshop (ACCOBAMS, 2017) and the updated questionnaire and guiding document are presented in Appendix 6. A global review process of those inputs will be led by the Scientific Committee.

Those inputs are considered as knowledge on threats and moreover also on impacts, happening in the different areas within the ACCOBAMS area. They will be used to define the level of confidence in the CCH highlighted by the mapping exercise of the CCH process. The CCH will then be classified following the categories: confident / Potential / Unknown

An example of this mapping comparison between CCH and expert's knowledge layer regarding the human threats is show in Figure 12 and Figure 13

Comparison between the CCH of fin whale versus marine traffic and the expert's knowledge
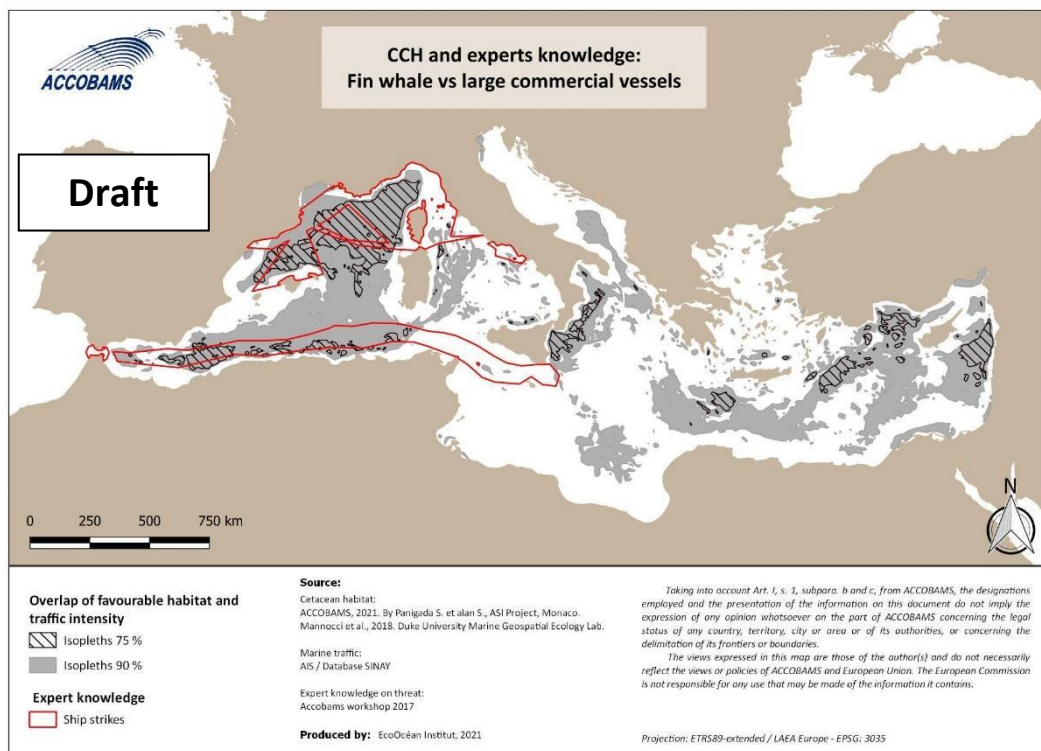

Figure 12: Example of map of comparison between the Cetacean Critical Habitat of the fin whale vs marine traffic and the expert's knowledge in the Mediterranean Sea (draft)
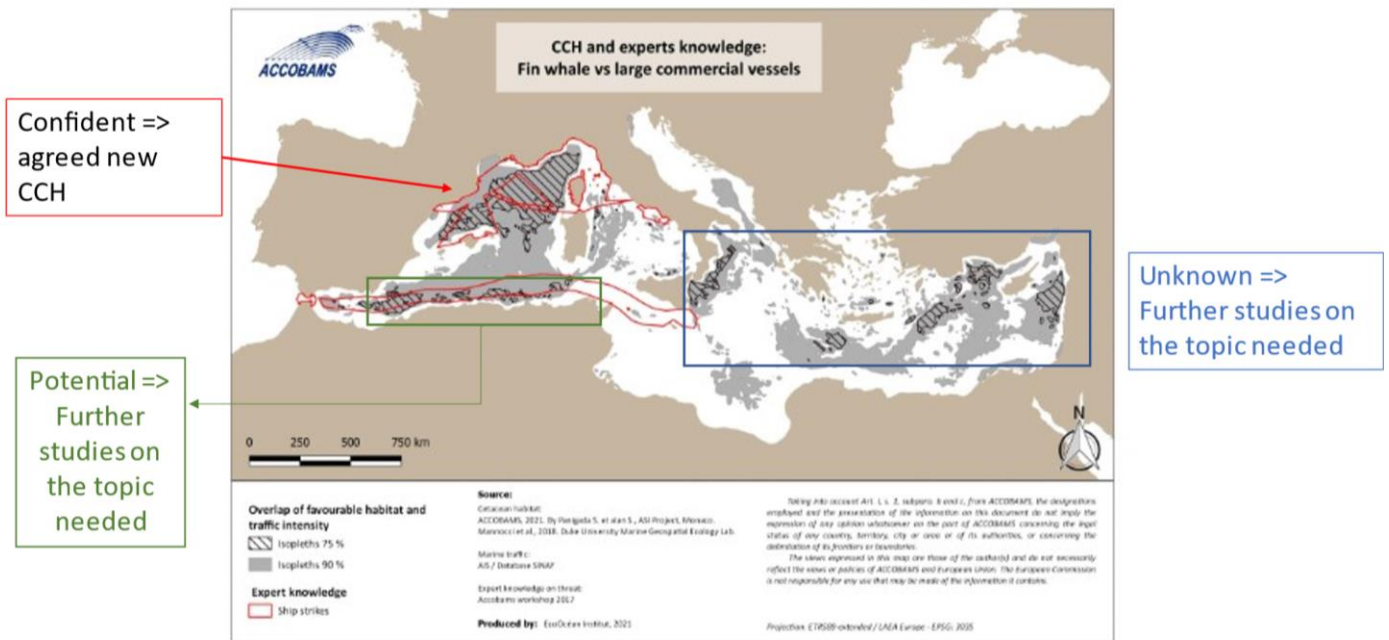
Figure 13: Example of map of comparison between the Cetacean Critical Habitat of the fin whale vs marine traffic and the expert's knowledge in the Mediterranean Sea with level of confidence induced

6.3   Identification of the type of interaction and/or threat within the CCH

CCHs have been built with human activities maps and species maps. But one pressure may impact in different ways the same species, as for example, marine traffic may impact fin whales through ship strike and also through continuous low frequency noise. So, the CCH "marine traffic" for fin whales will/may represent both those threats. If potential of ship strikes and potential impact of continuous noise have been analysed and mapped separately, then within the CCH "marine traffic and fin whale" it will be possible to find the different threats maps.

For fishery, at this stage, only a global CCH of potential interactions can be drawn. Those interactions can be, at a further step, defined per gear or métier. Such a layer per gear can be done as some data exist per gear, but not sure if data exists or are available to spatialise at the Mediterranean level or ACCOBAMS level the different types of fishing or métier.

7   Perspectives for management and/or conservation measures

As a first next step, the obtained CCH should be discussed among the Scientific Committee and relevant experts with updated knowledge.

Then the process to simplify the limits of the polygons defining areas easier to be managed will arise. The rule for smoothing the CCH shapes, will be the following:

- Smoothing automatically through GIS tools

- Include buffer area

- Review and improvement in a case-by-case basis from experts

Then, identification of relevant measures for adequate management in each CCH will have to be discussed, in collaboration with all stakeholders including other Organizations, such as UNEP-MAP/RAC-SPA, BSC, IMO, IWC, and GFCM, in particular through the Strategic Alliance.

For management purposes there will probably appear the need to lead further more in-deep analysis, either on a case-by-case CCH basis, or for some, at the regional scale. For example, for marine traffic and ship strikes, as lethality rises with speed of the vessels, it may be useful to define the parts of the CCH which include the paths of the vessels with the highest speed. In the example below, vessels were split into 3 categories, with threshold coming from a review of the literature on ship strike for cetaceans:

- ships with speeds ≤ 14 knots
- ships with speed ranging between 14 and 30 knots
- ships with speed > 30 knots

Example of marine traffic in the northwestern Mediterranean Sea (NWMS)

Figure 14 and Figure 15 show examples of the overlap of respectively 75% and 90% of the favourable habitat of large cetaceans and the annual marine traffic of large commercial vessels split by categories of speed, focused on the NWMS.
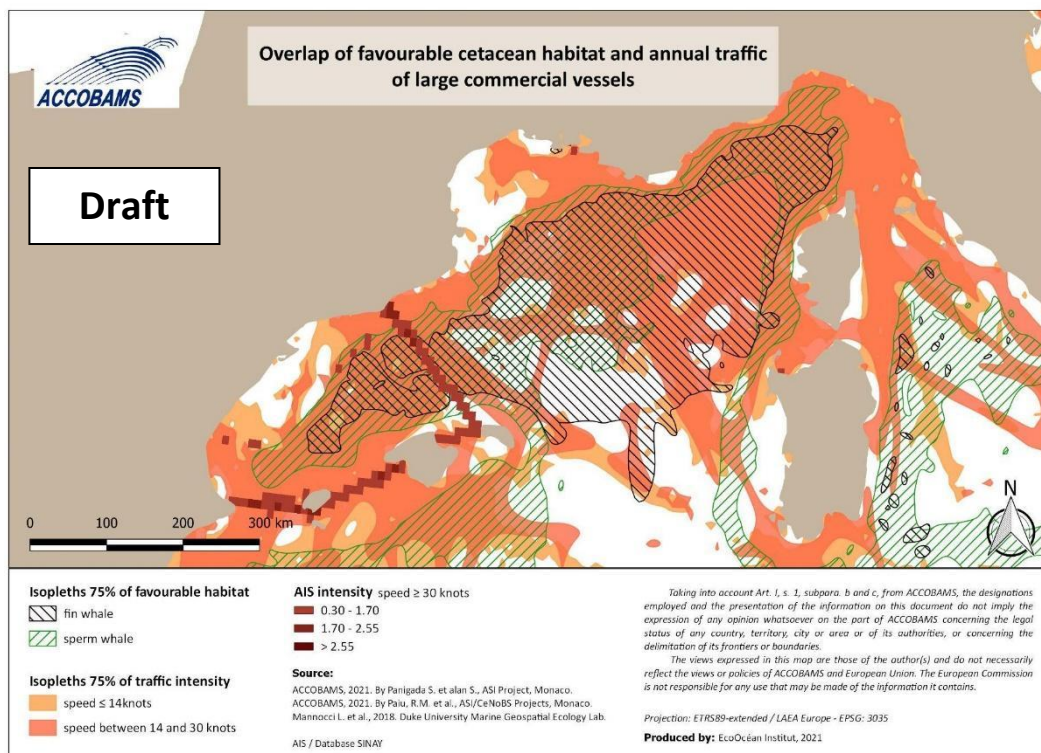

Figure 14: Overlap of 75% of the favourable habitat of large cetaceans and 75% of the annual marine traffic with vessel speeds ≤ 14 knots, between 14 and 30 knots and > 30 knots, in the NWMS
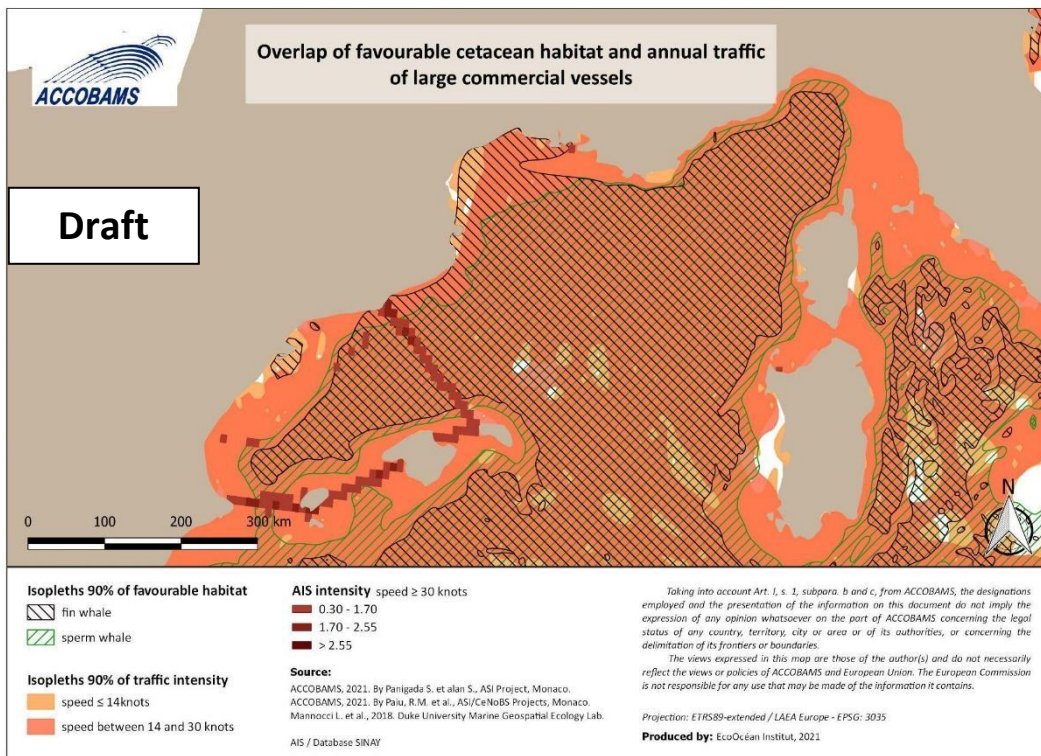
Figure 15: Overlap of 75% of the favourable habitat of large cetaceans and 75% of the annual marine traffic with vessel speeds ≤ 14 knots, between 14 and 30 knots and > 30 knots, in the NWMS

Another example is the need to go further in precision as for the fishery activities that need to be mapped by gear or metier, at the ACCOBAMS scale or at some CCH scale.

Globally, it seems that the exercise is a useful tool and there is a need to pursue the exercise with all types of pressures and species. It highlights areas where cetaceans may be at risk, and where this is already known and the work toward identifying the adequate management measures should begin. But it also shows where a cetacean may be at risk in areas unknown or less known yet by the scientific community, needing research to confirm their status of CCH. The example in Figure 16 shows how CCH maps can be used.
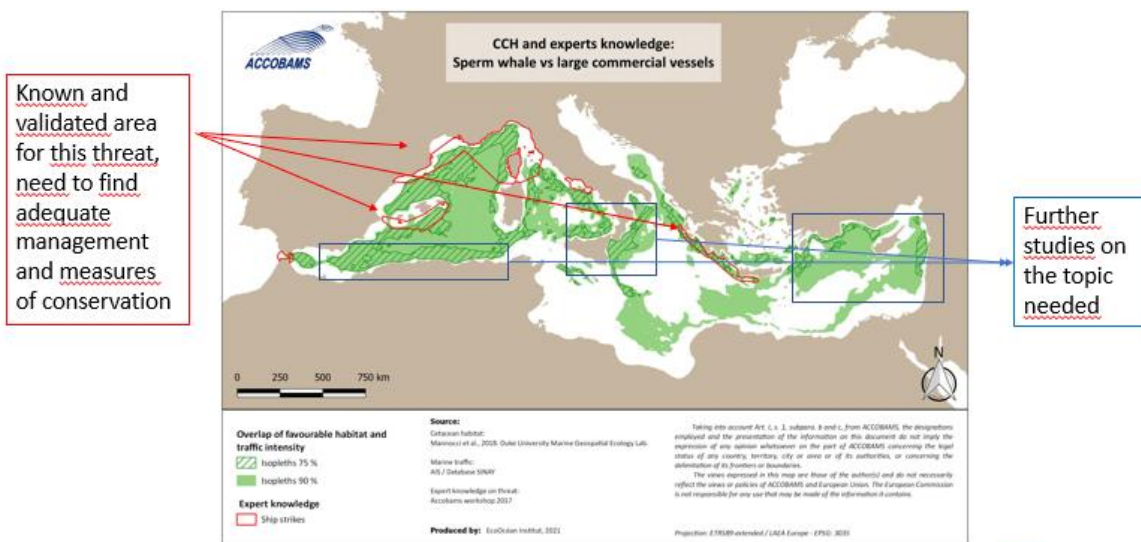
Figure 16: Perspectives of work from CCH maps

Moreover, for punctual/temporal human activities generating impulsive noise, such as oil&gas prospecting, naval exercises, explosion, coastal building, etc, it is not possible to define CCH related to them due to their punctual occurrence. Nevertheless, those activities are impacting cetaceans and should therefore be considered within the process. Therefore, a simple rule can be agreed on: none of those activities should occur within the IMMA or within the cetacean's species reference maps or within an existing Marine Protected Area (https://mapamed.org/). If it may occur, each time a human activity generating impulsive noise is located within an IMMA or within the cetacean's species reference maps or within a MPA, it should be considered as a punctual/temporal CCH and mitigation measures (impact assessment study, sectoral measures, operational measures…) should automatically be requested.

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- Appendices

Appendix 1: Cetacean input data

ACCOBAMS Survey Initiative

The table below shows the parameters and selected covariates for the model for a group of species in the Mediterranean Sea.

Table: Parameters and selected covariates (edf = estimated degrees of freedom; p = significance of the covariate) for the fin whales, Risso's dolphins, striped dolphins and bottlenose dolphins in the Mediterranean Sea (ACCOBAMS (a), 2021)

Species	Resp. Variables	Groups/Individuals				Group size			
		Covariates	edf	p	Deviance explained (%)	Covariates	edf	p	Deviance explained (%)
Fin whales	Indviduals	Lat	1.15	<0.001	45.2				
		Lon	1.16	<0.001					
		mlt_0608	0.89	0.0038					
		distshelf	1.06	<0.001					
Risso's dolphins	Groups + Grsize	distcanes	0.86	<0.001	19.6	Lat	0.64	0.1	38.9
		Lon	1.04	<0.001		mlt_0608	0.75	0.047	
		mlt_month	0.89	<0.001		ssh_0608	1.81	<0.001	
		CI	1.50	<0.001					
Striped dolphins	Groups + Grsize	Lat-Lon	13.67	<0.001	26.9	Aspect	1.28	0.106	13.2
		depthmax	4.18	<0.001		Lat	0.62	0.126	
						Lon	0.82	0.019	
						SD_sst_month	5.74	<0.001	
Bottlenose dolphins	Groups + Grsize	Lat-Lon	20.06	<0.001	15.3	depthmax	2.5	0.004	18.6
		CI	2.39	<0.001		distcany	0.66	0.079	
						mlt_0608	0.72	0.069	
						sst_0608	0.92	<0.001	

The following maps illustrate the predicted abundance of the fin whales, the Risso's dolphins, the bottlenose dolphin and the striped dolphin in the Mediterranean Sea.
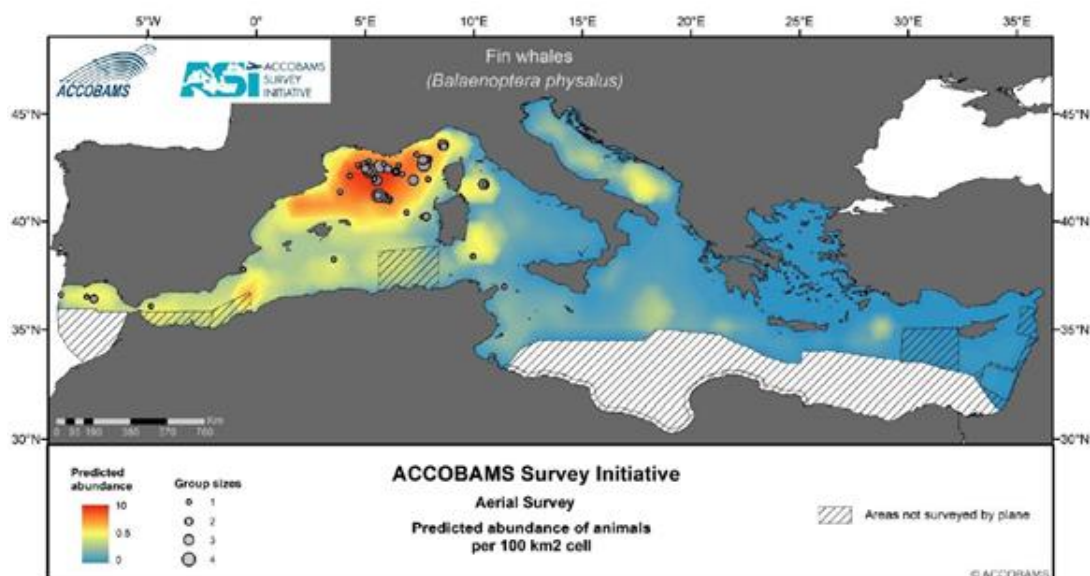
Figure: Predicted abundance of the fin whale species in the Mediterranean Sea (ACCOBAMS (a), 2021)
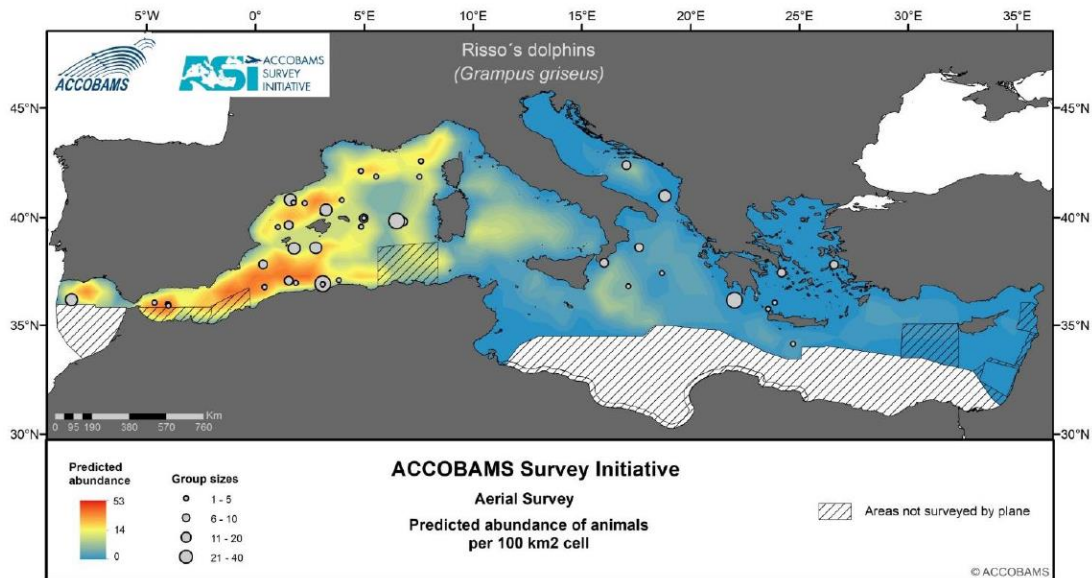
Figure: Predicted abundance of the Risso's dolphin species in the Mediterranean Sea (ACCOBAMS (a), 2021)
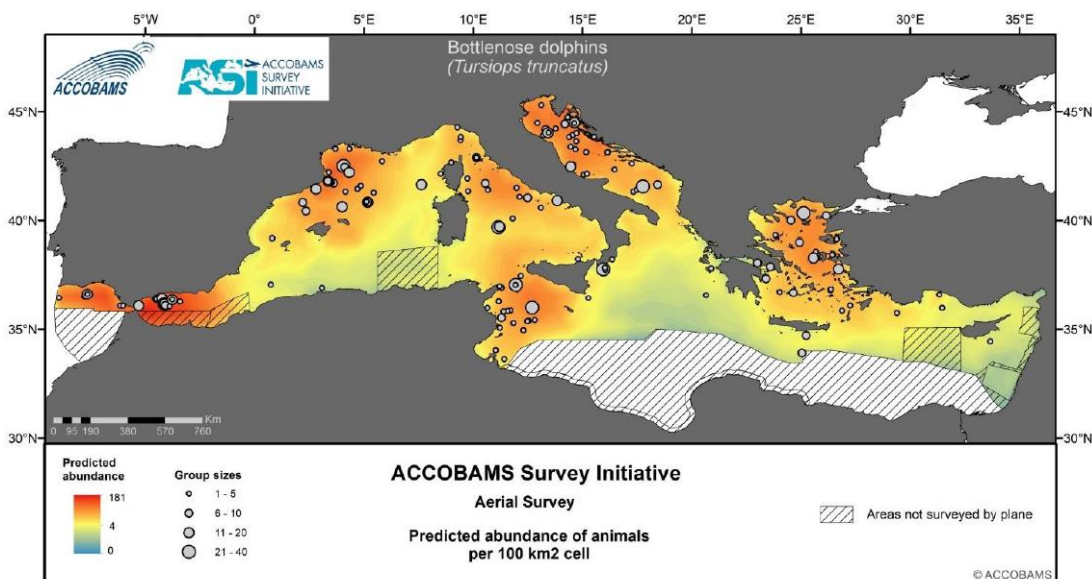

Figure: Predicted abundance of the bottlenose dolphin species in the Mediterranean (ACCOBAMS (a), 2021)
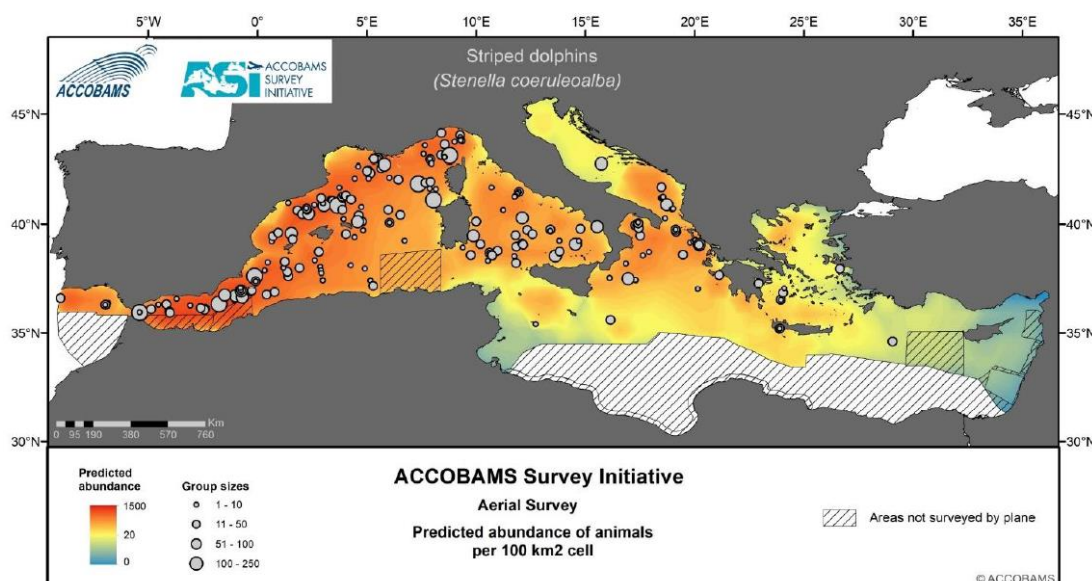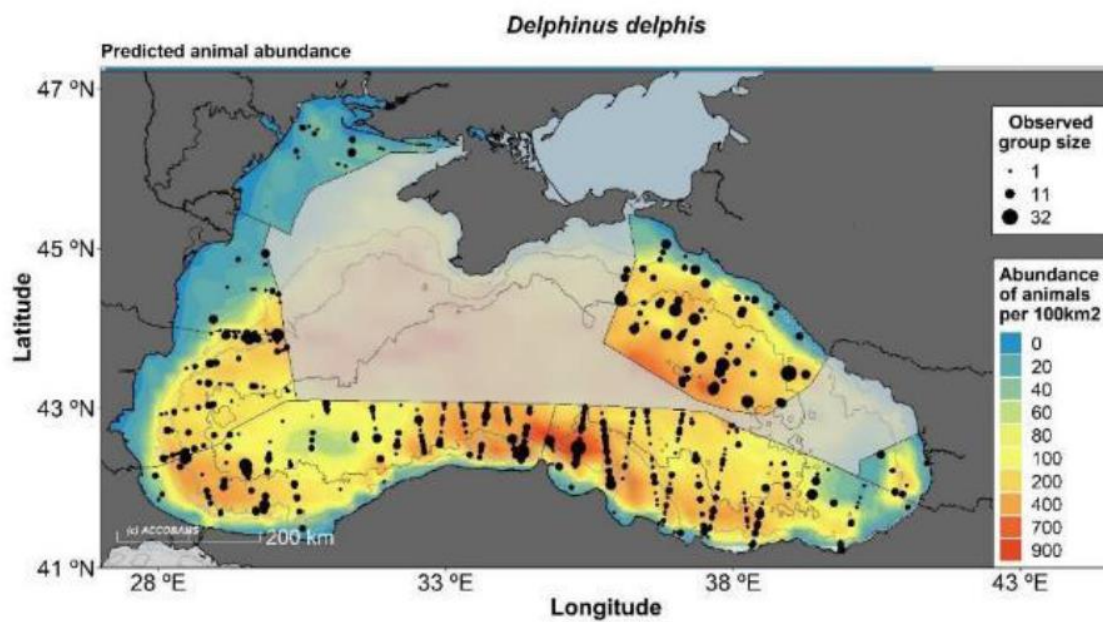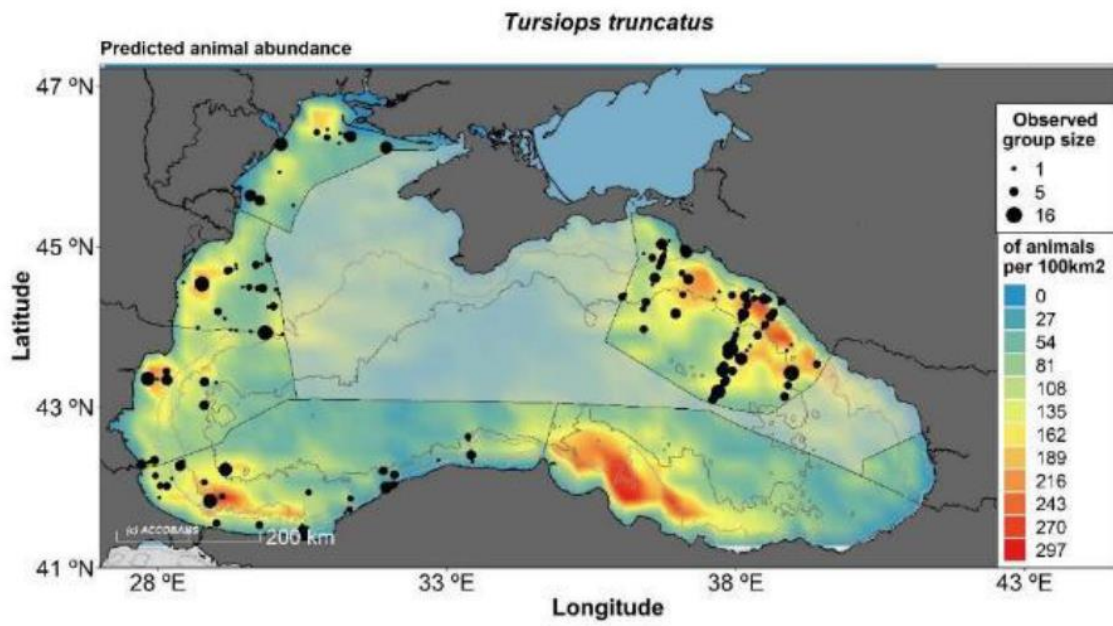

Figure: Predicted abundance of the striped dolphin species in the Mediterranean Sea (ACCOBAMS (a), 2021)

The table below shows the parameters and selected covariates for the model for a group of species in the Black Sea.

Table: Parameters and selected covariates (edf = estimated degrees of freedom; p = significance of the covariate) for the common dolphins, bottlenose dolphins and harbour porpoise in the Black Sea (ACCOBAMS (b), 2021)

Species	Blocks	Groups				Group size			
		Covariates	edf	p	Deviance explained (%)	Covariates	edf	p	Deviance explained (%)
Common dolphins	All blocks	Lat,Lon	17.04	0.00000	33.72	Lon	5.57	0.00000	27.40
		Slope	3.41	0.00023		ssc_mean_season	0.96	0.00095	
		ssc_spsd	4.52	0.00000		ssc_spsd_season	5.96	0.00000	
		ssh_mean	5.46	0.00000		ssh_mean_season	5.35	0.00000	
						sst_spsd	0.89	0.00346	
Bottlenose dolphins	All blocks	DistCanEsc	0.89	0.00559	22.59	Dist100	0.91	0.00400	13.60
		DistPorts	0.98	0.00022		DistSlope	4.77	0.00018	
		ssc_spsd_season	2.58	0.00001					
		sst_mean	5.15	0.00000					
Harbour porpoise	All blocks	Lat,Lon	21.30	0.00000	50.75	Lat,Lon	13.13	0.00000	26.79
		DepthMean	0.87	0.00831		Dist2000	7.57	0.00000	
		ssh_mean_season	3.13	0.00002		ssc_mean_season	8.21	0.00000	

The following maps illustrate the predicted abundance of the common dolphins, the bottlenose dolphins and the harbour porpoises.

Figure: Predicted abundance of the common dolphin species in the Mediterranean Sea (ACCOBAMS (b), 2021)

Figure: Predicted abundance of the bottlenose dolphin species in the Mediterranean Sea (ACCOBAMS (b), 2021)
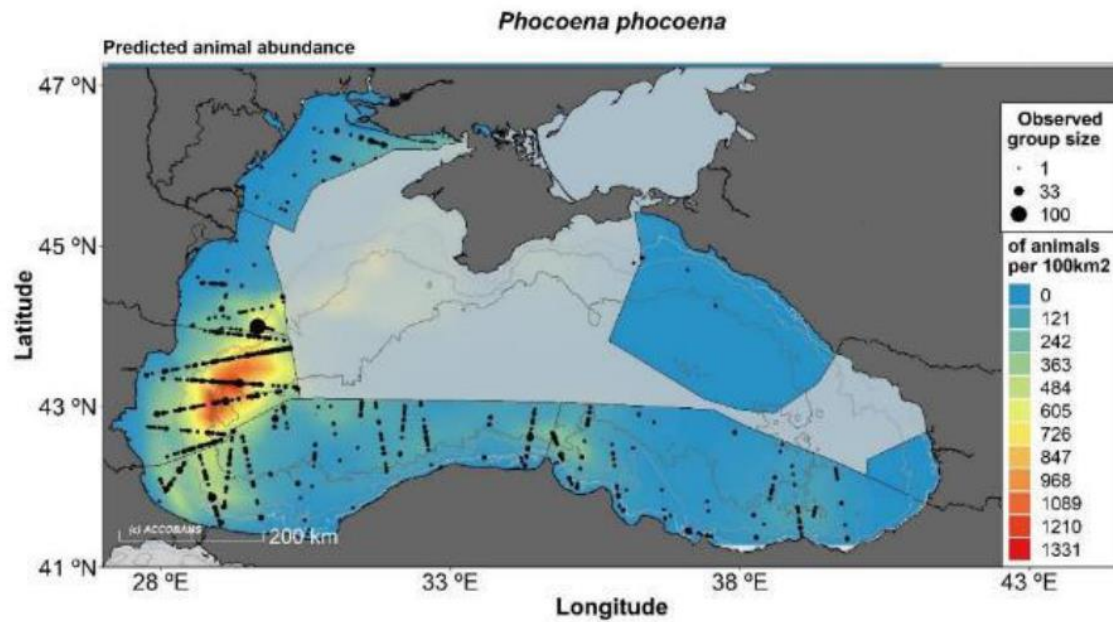

Figure: Predicted abundance of the harbour porpoise species in the Mediterranean Sea (ACCOBAMS (b), 2021)

Gap Analysis and spatial models of marine species

The following table shows the selected covariates used in the final model and its explained deviance.

Table: Selected GAMs based on lowest AIC for each species (Mannocci et al., 2018)

Species	Selected covariates (ordered with in decreased order of importance following F-scores)	Explained deviance (%)
Striped dolphin	Depth NemoSSTMonthly VGPMMonthly SalinityMonthly	17.9
Common bottlenose dolphin	Depth Slope SalinityMonthly	17.3
Short-beaked common dolphin	SalinityMonthly SSTMonthly OPFishMonthly5 Depth	48.3
Risso's dolphin	Depth	11.5
Long-finned pilot whale	Depth SalinityMonthly VGPMMonthly SSTMonthly	44.5
Fin whale	Depth OPFishMonthly5 Slope SalinityMonthly	23.8
Sperm whale	Depth OPFishMonthly3 NPPMonthly	22.0
Cuvier's beaked whale	Depth Slope	36.2

The following maps illustrate the predicted abundance of the sperm whale, the fin whale, the Cuvier's beaked whale, the bottlenose dolphin, the striped dolphin, the long-finned pilot whale, the Risso's dolphin and the common dolphin in the Mediterranean Sea.
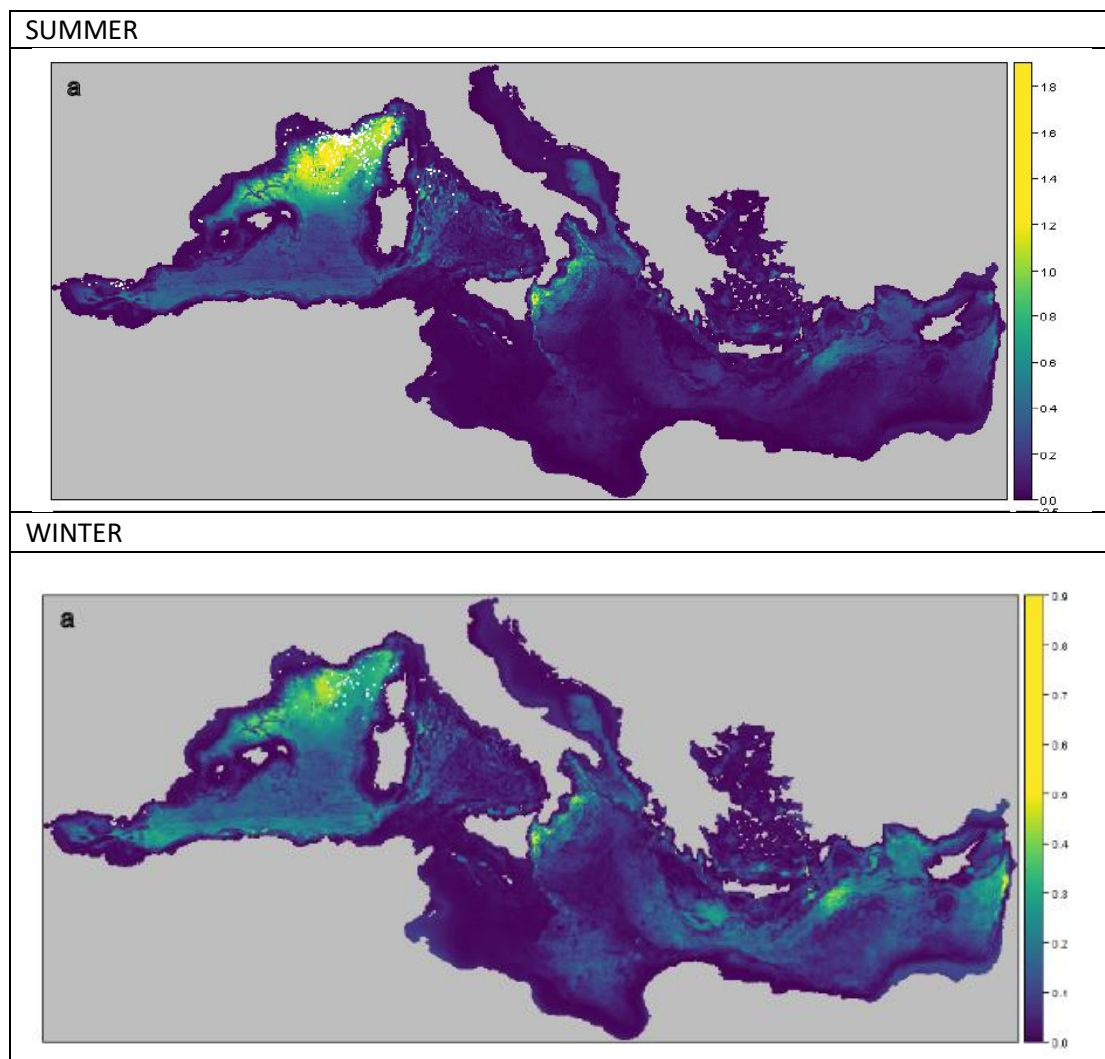
Figure: Maps of mean summer (top) and winter (bottom) predicted densities of the fin whale (individuals per 25 km2). The summer season was defined from March to August and the winter season was defined from September to February. Sightings are overlaid in white on maps (Mannocci et al., 2018)
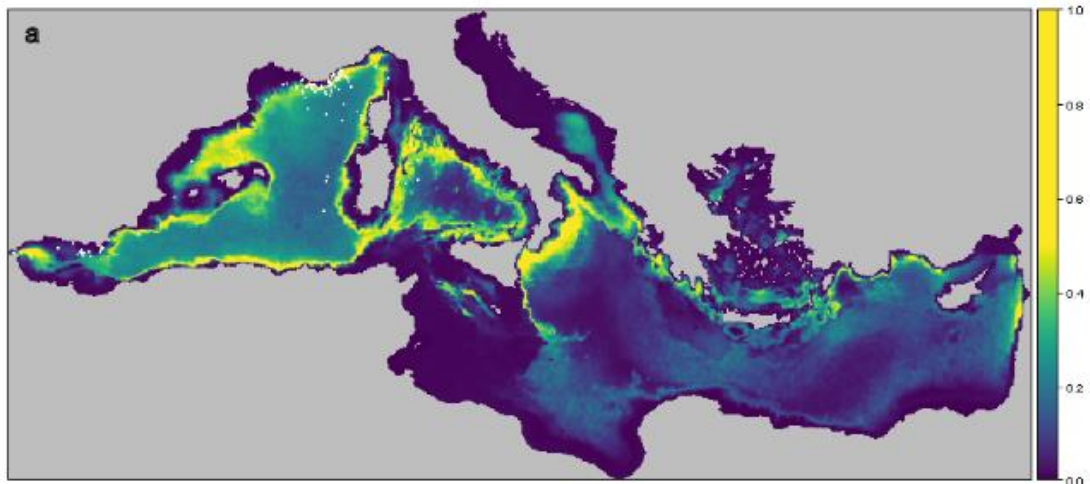
Figure: Map of mean annual predicted densities of the sperm whale (individuals per 25 km2). Sightings are overlaid in white on the map (Mannocci et al., 2018)
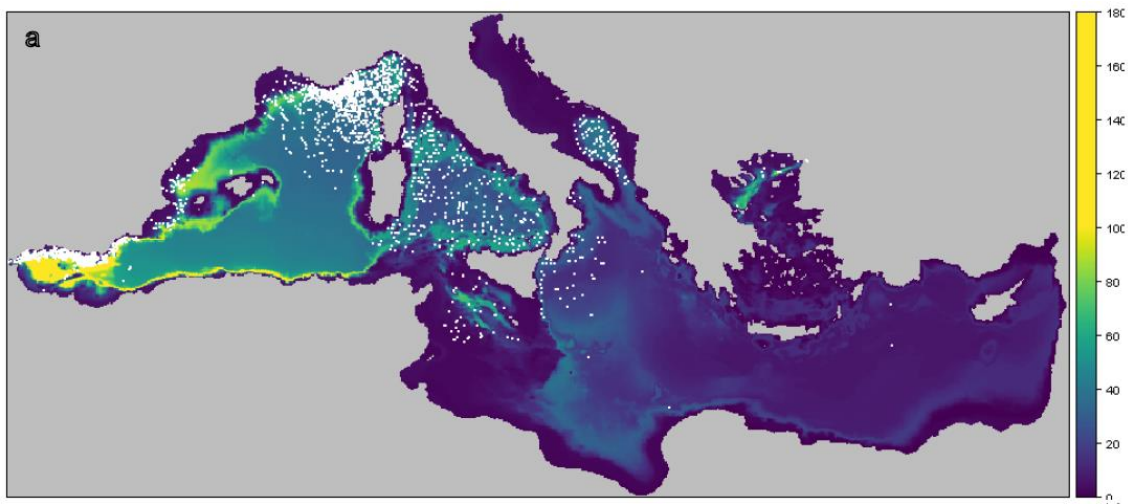

Figure: Map of mean annual predicted densities of the striped dolphin (individuals per 25 km2). Sightings are overlaid in white on the map (Mannocci et al., 2018)
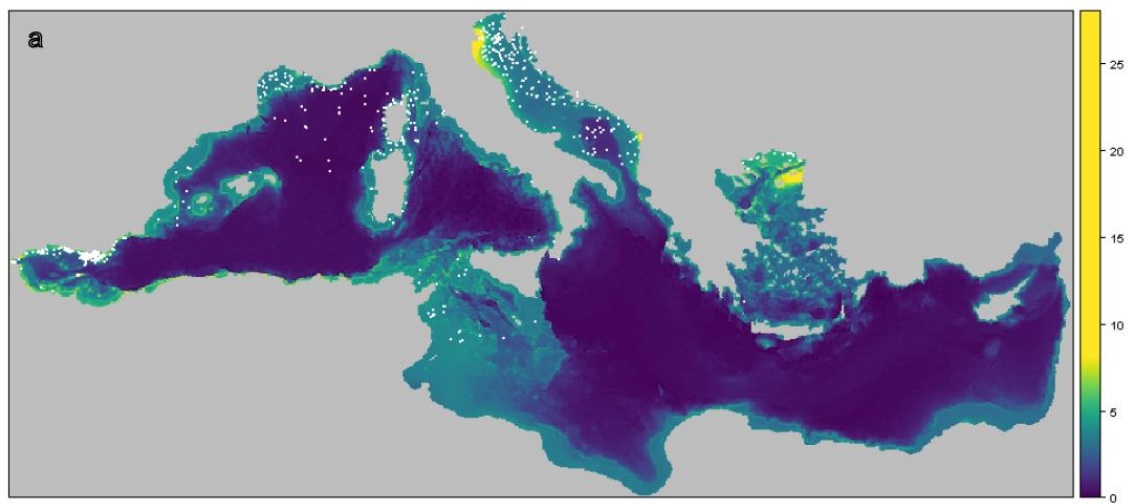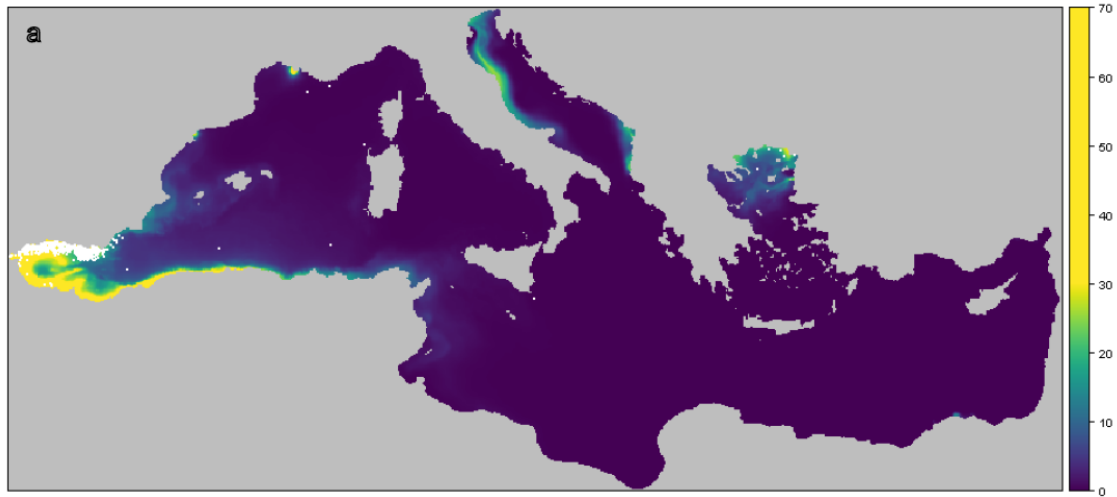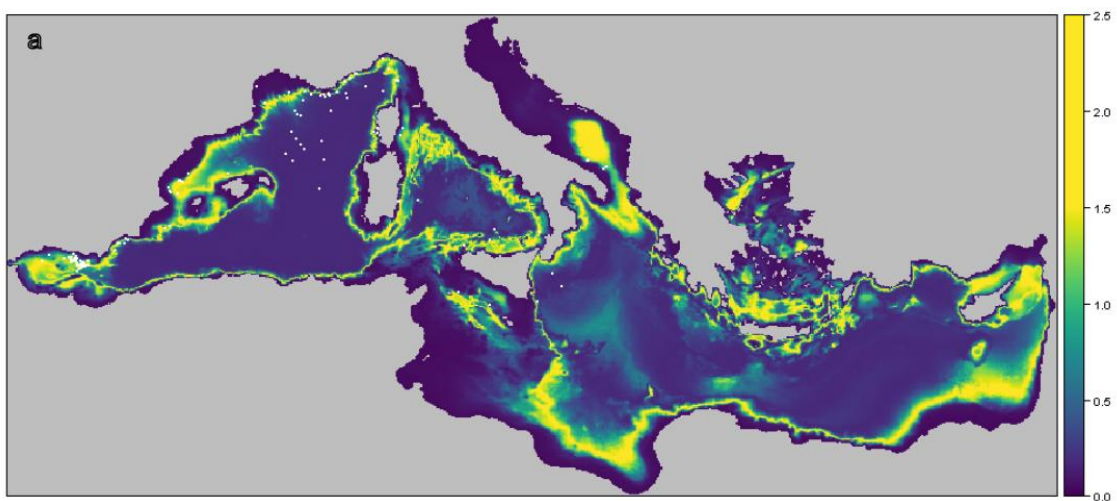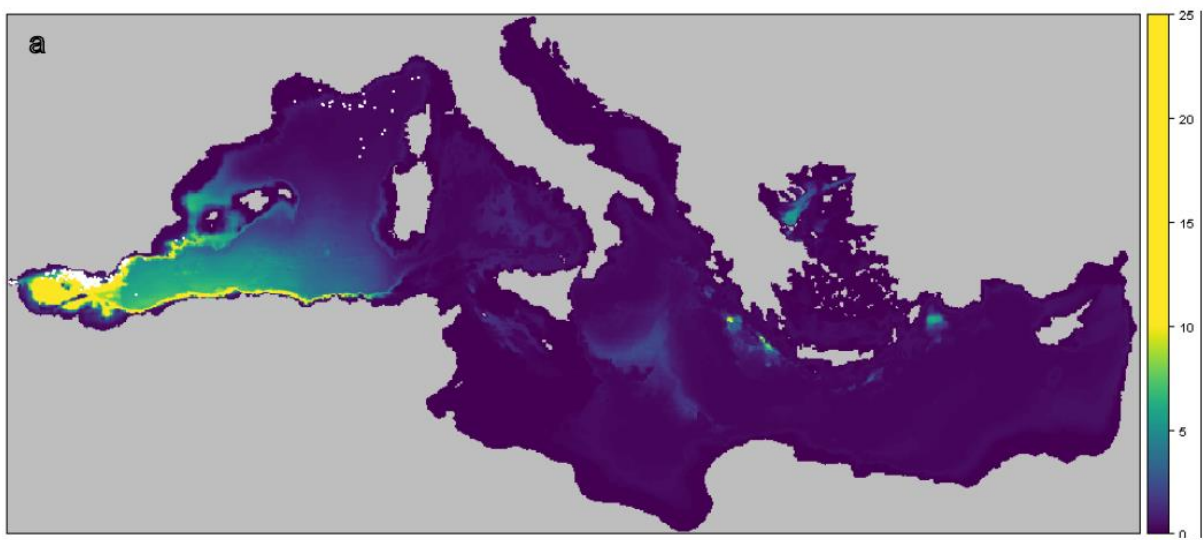

Figure: Map of mean annual predicted densities of common bottlenose dolphin (individuals per 25 km2). Sightings are overlaid in white on the map (Mannocci et al., 2018)

Figure: Map of mean annual predicted densities of the short-beaked common dolphin (individuals per 25 km2). Sightings are overlaid in white on the map (Mannocci et al., 2018)

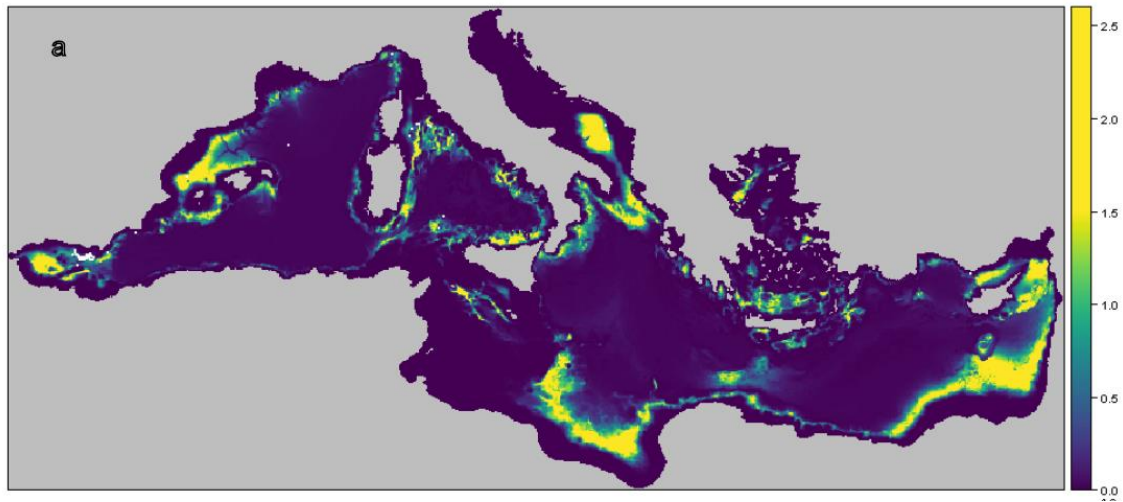*Figure: Map of mean annual predicted densities of the Risso's dolphin (individuals per 25 km2). Sightings are overlaid in white on the map (Mannocci et al., 2018)*

Figure: Map of mean annual predicted densities of the long-finned pilot whale (individuals per 25 km2). Sightings are overlaid in white on the map (Mannocci et al., 2018)

Figure: Map of mean annual predicted densities of the Cuvier's beaked whale(individuals per 25 km2). Sightings are overlaid in white on the map (Mannocci et al., 2018)

Appendix 2: Example with the map of fin whale

Step 1: Extraction of contour

Maps below are displaying 75% and 90% of the highest densities areas (also considered as the favourable habitat) for the fin whale species from ACCOBAMS Survey Initiative and from Mannocci et al. 2018.
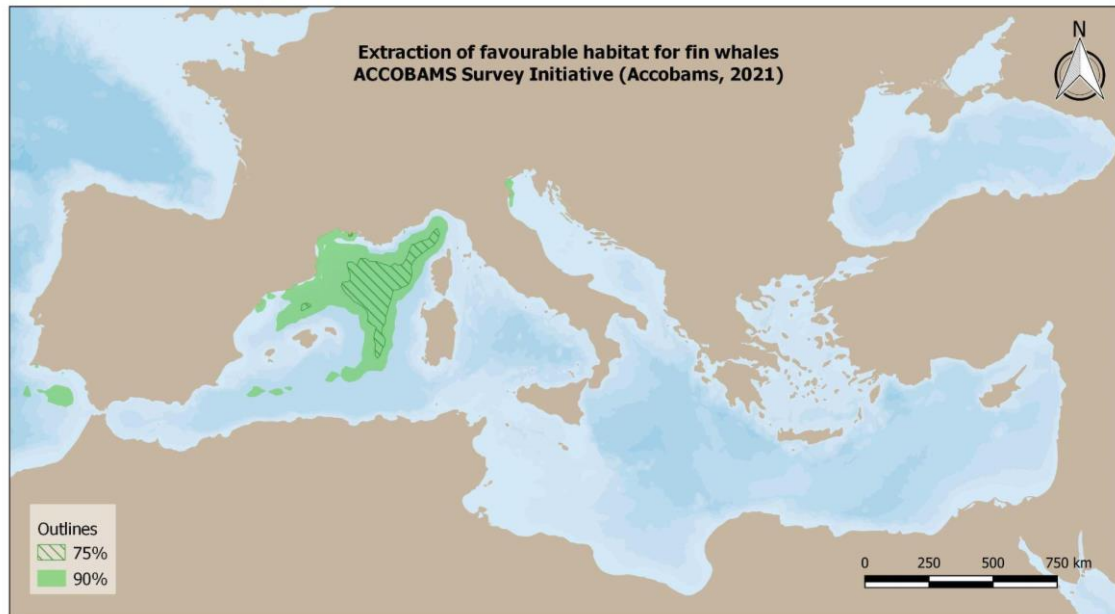

Figure: Extraction of 75% and 90% of the favourable habitat for the Fin whale from ACCOBAMS Survey Initiative data
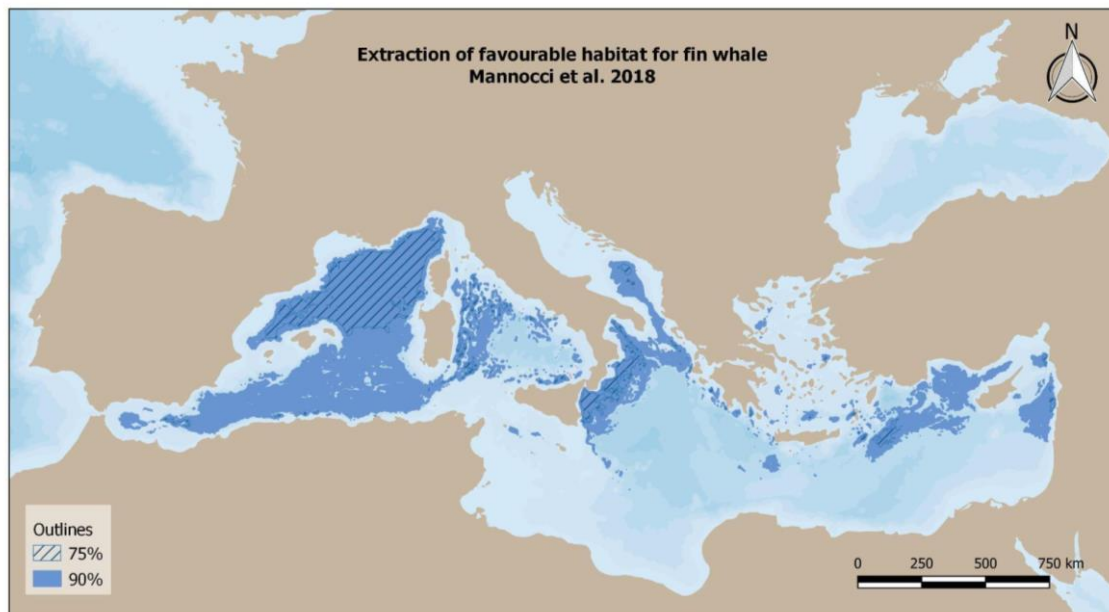

Figure: Extraction of 75% and 90% of the favourable habitat for the Fin whale from Mannocci et al. 2018

Step 2: Merging of the habitats

The maps extracted from ACCOBAMS 2021 and from Mannocci et al. 2018 have been merged according to the % of favourable habitat for the species (75% and 90%).
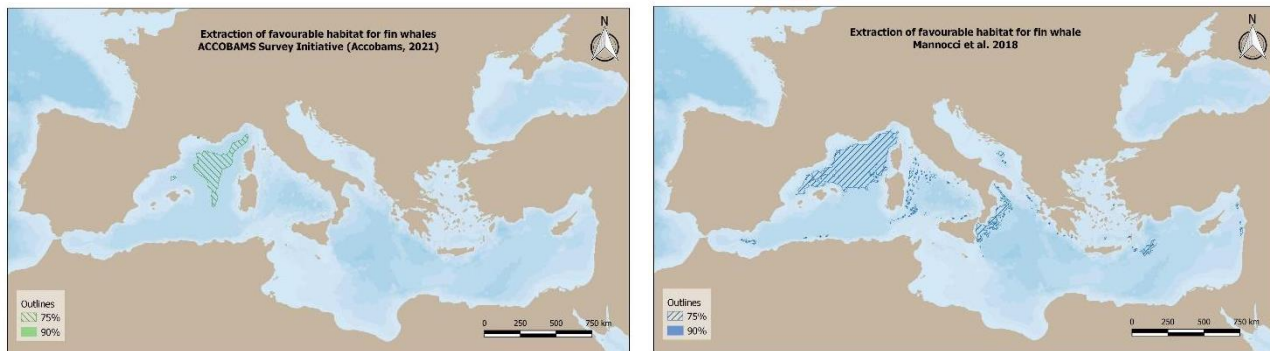

Figure: 75% of the favourable habitat for the fin whale from ACCOBAMS and from Mannocci et al., 2018
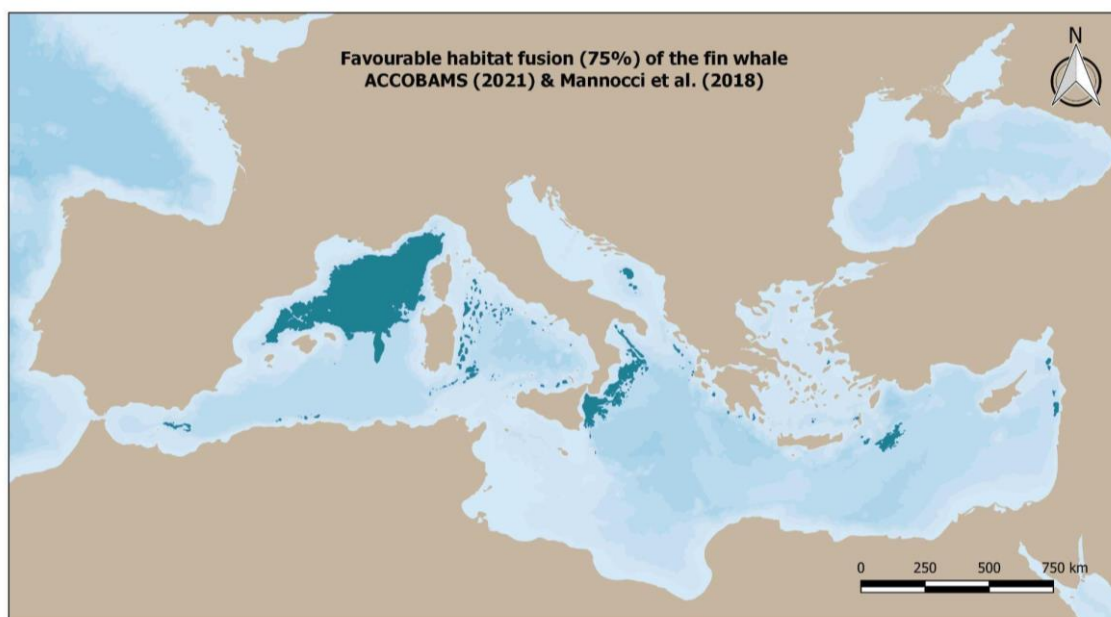

Figure: Merging of the two previous maps corresponding to the 75% of the favourable habitat for the Fin whale
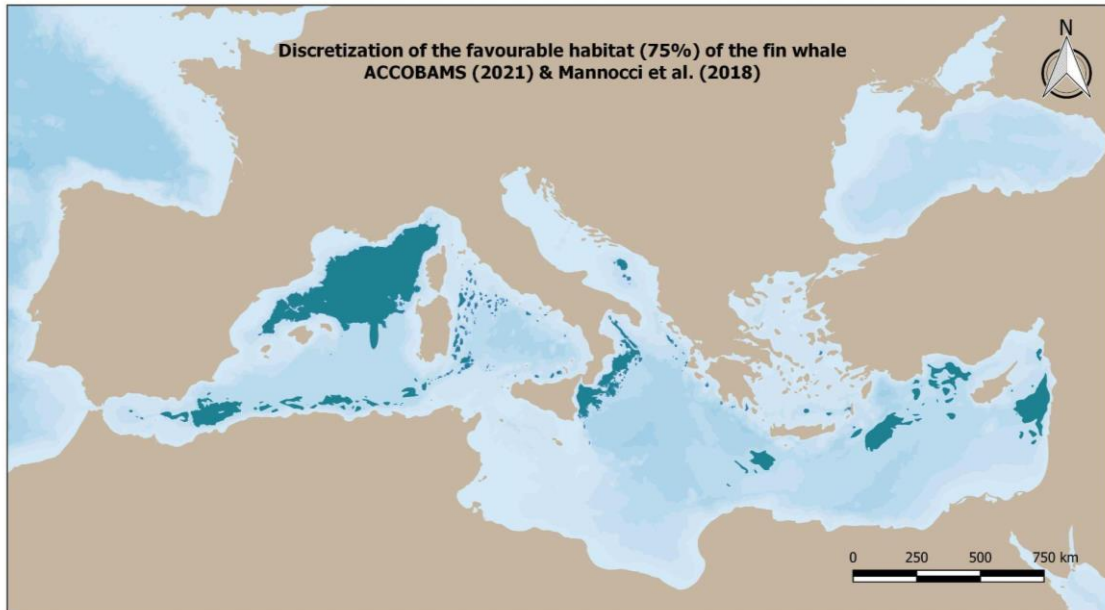
Step 3: Discretization of the "habitats"

Figure: Discretization of the 75% of the favourable habitat for the Fin whale species in the Mediterranean Sea
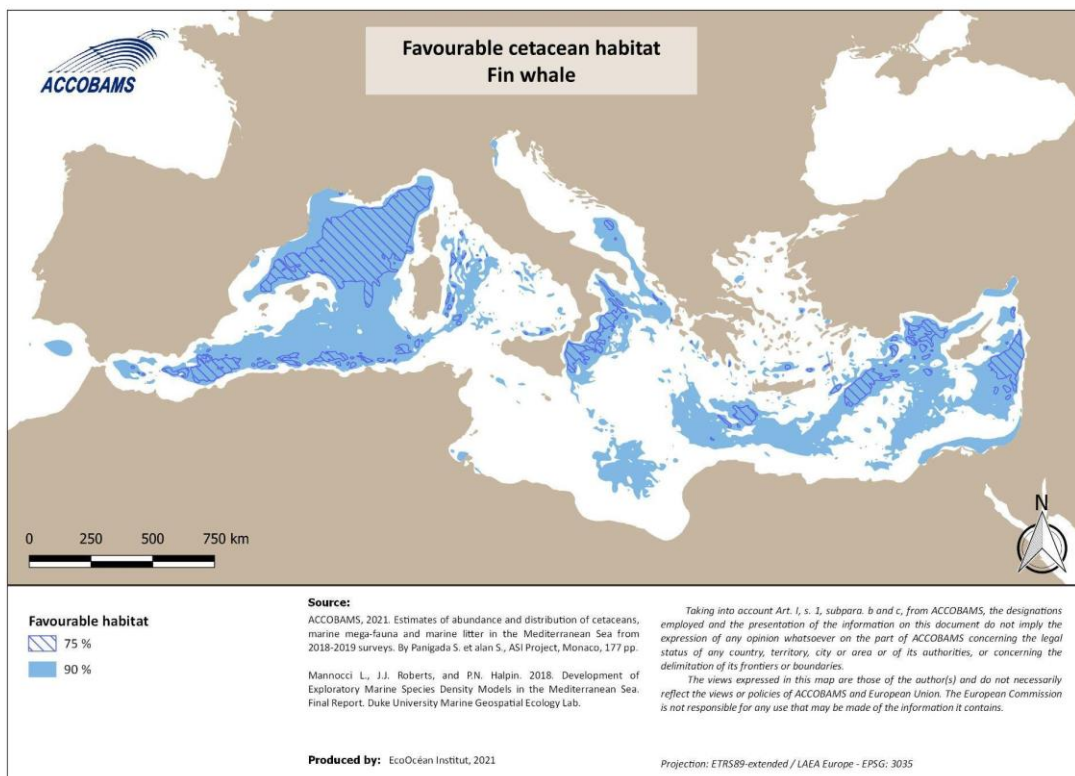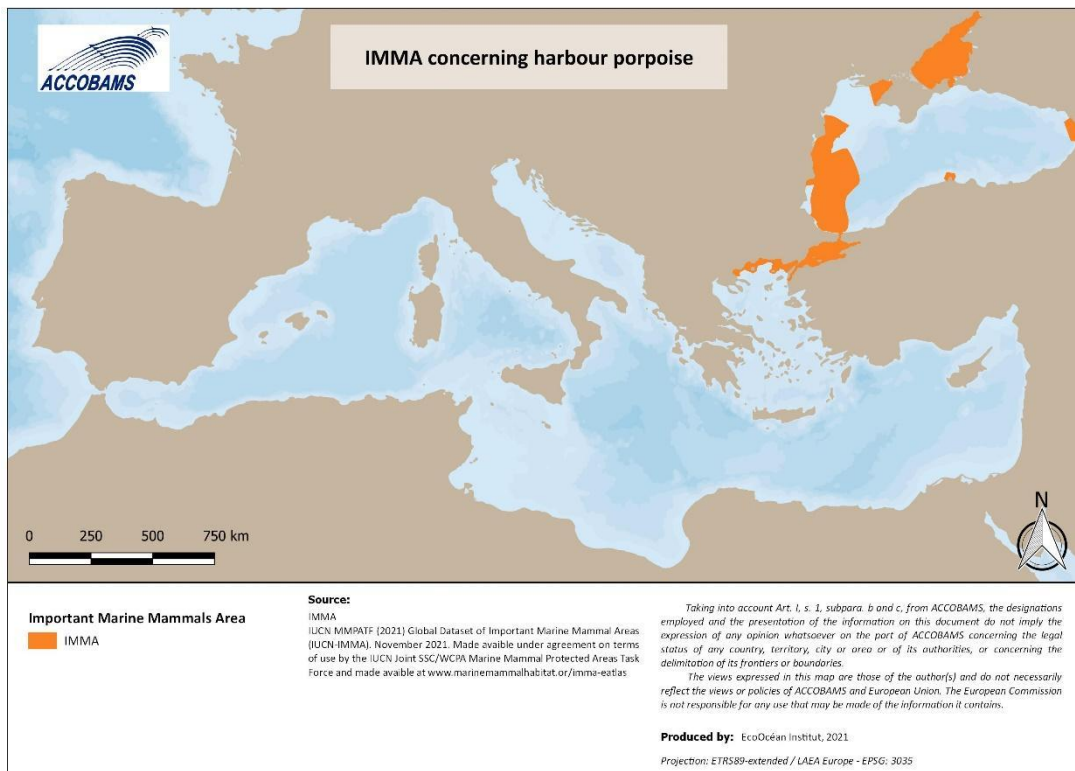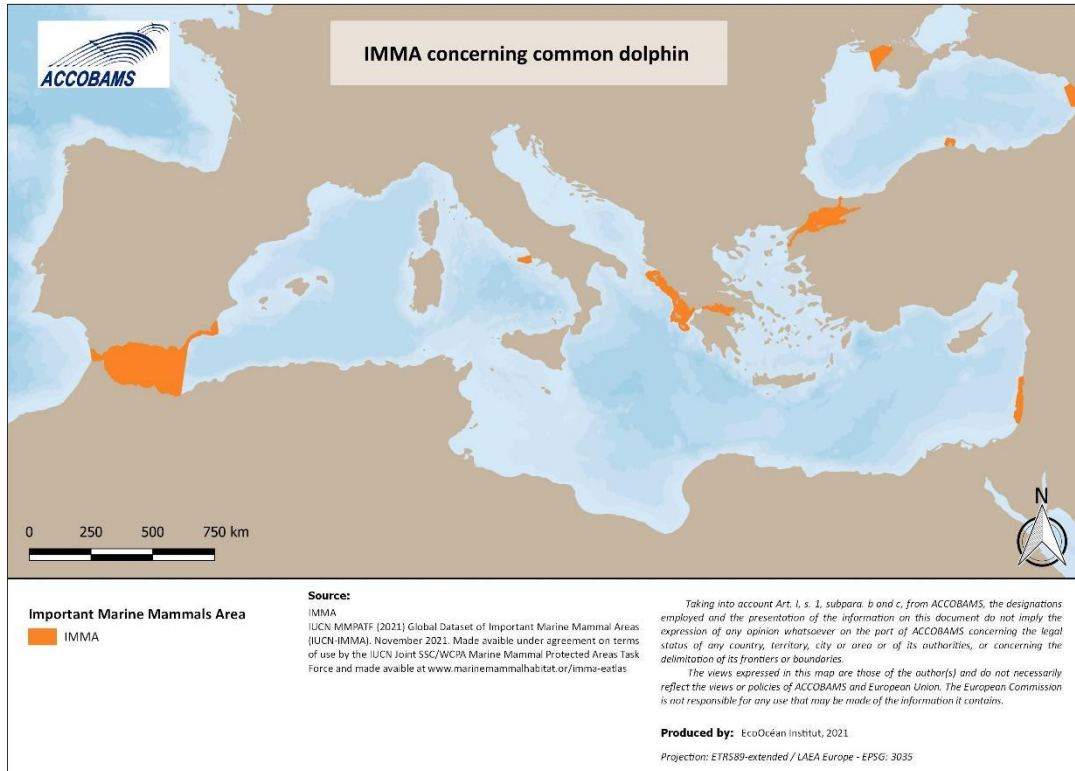
Step 4: Habitats cleaning

Figure: Example of favourable habitat for the Fin whale

Appendix 3: Map of IMMA

Appendix 4: Fishery polygons

Figure below shows the annual fishing effort (all types of fishing activity) displaying 75% and 90% of the fishing effort from the Global fishery watch data.
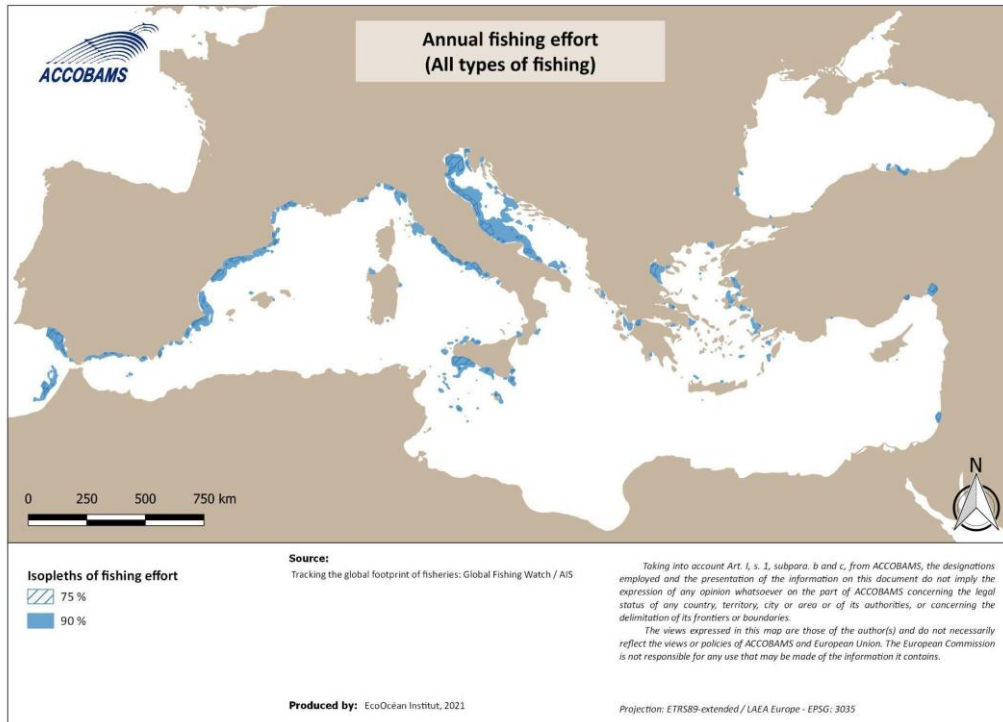

Figure: 75% and 90% of the fishing effort in the Mediterranean Sea

Figure illustrates the annual fishing in the Mediterranean Sea with an effort of fishing ≥ 1 hour, for all types of fishing vessels.
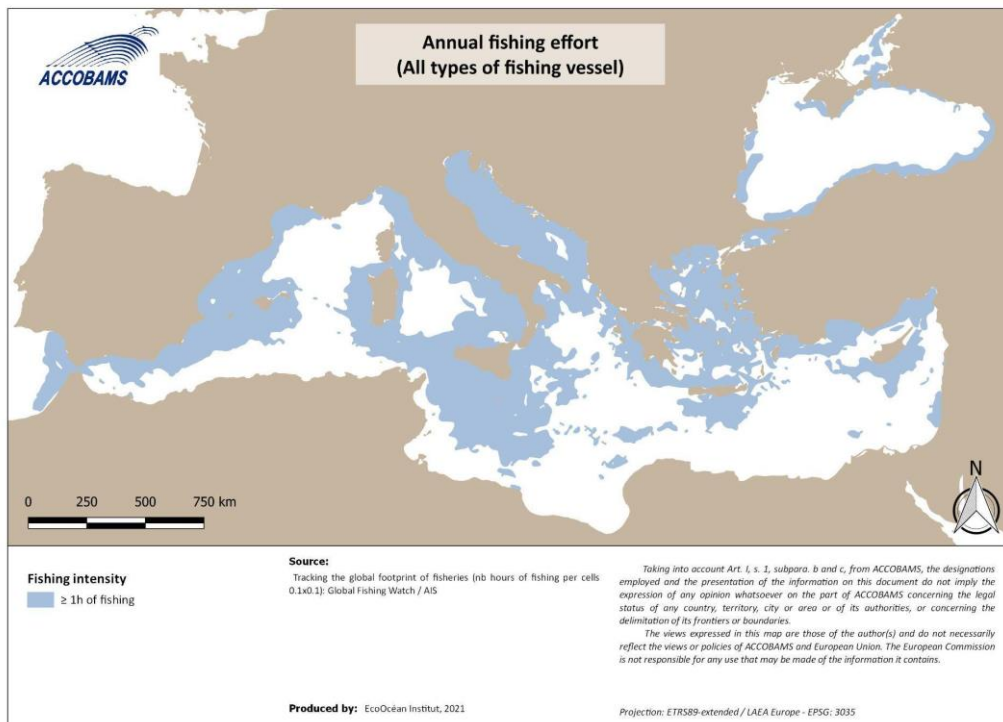

Figure: Annual fishing effort ≥ 1 hour in the Mediterranean Sea

Appendix 5: Overlap and intersect between favourable cetacean habitats and annual traffic of human activities

Since fin whale and sperm whale are the species most affected by the collision risks with large vessels, 75% of the favourable habitats for these two species have been overlapped with 75% of the large commercial vessels traffic intensity (all speeds combined), the overlapping is displayed on the map below.

Figure: Example of overlap between 75% of the favourable habitat of Sperm whale and Fin whale and 75% of the large commercial vessels intensity

The map below shows the overlap between 90% of the favourable cetacean habitat and 90% of the large commercial vessels intensity.
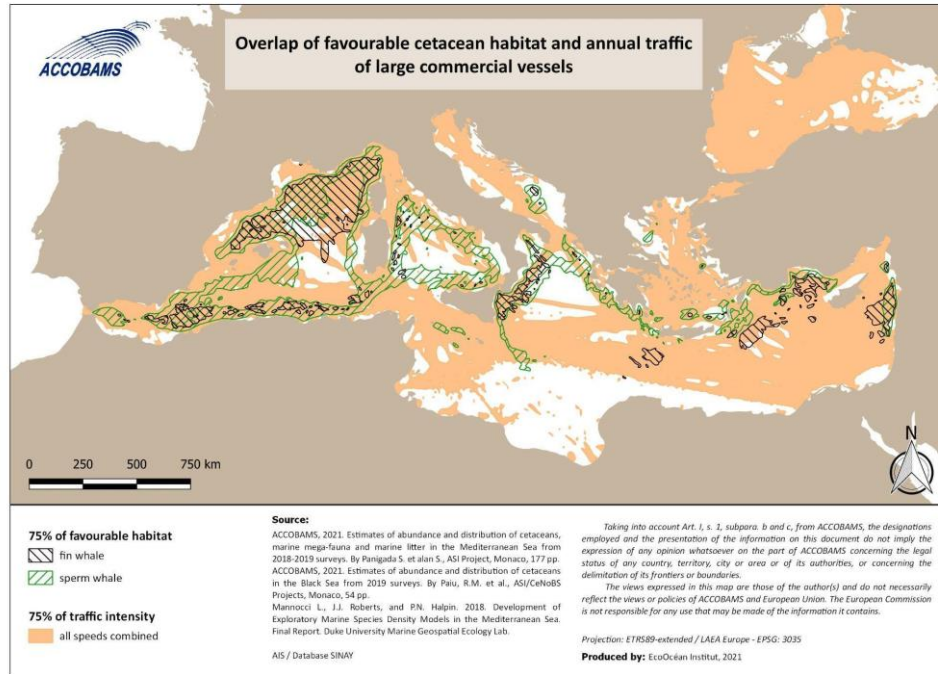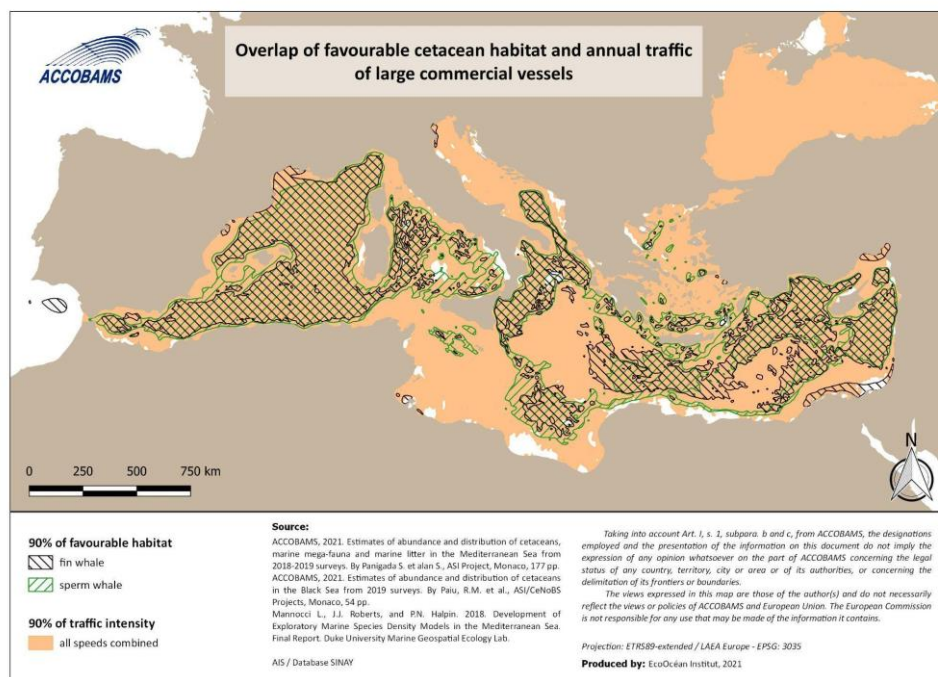

Figure: Example of overlap between 90% of the favourable habitat of Sperm whale and Fin whale and 90% of the large commercial vessels intensity

Appendix 6: Questionnaire and guiding document for expert's knowledge on threats for cetaceans in their areas of study

Appendix 6: Questionnaire for expert's knowledge gathering

QUESTIONNAIRE
Regarding the contribution and update of the GIS layer of "expert's knowledge" of ACCOBAMS for the CCH process

List in the table all the polygons you created based on the guiding document and the template, and associated to this questionnaire and that you will send to ACCOBAMS for the CCH process:

Name of the "threat area"	Threat	Species impacted

YOU AND "YOUR" AREA

Name and surname :

Country :

City :

Organism or affiliation :

Profession/role :

Email :

Area that you know well and for which you answer in that questionnaire:

Your main topics and species studied:

Existing threat	what we need	Ship strike (commercial and passenger vessel)	Confidence in your information and expertise (high, moderate, low)
Species of cetacean impacted	*Name(s) and specify if impact is different for each species*		
Map of area where this threat occurs	*A polygon + knowledge on confidence about boundaries and surface*		
On what was the polygon build on	*Type of data, interval of years and which years, methodology*		
Temporality of this threat	*all year long, only in summer,…*		
Data type existing on that threat	*(strandings, pictures, …)*		
Number of cetaceans impacted	*dead or injured per year or since…* (summary + indication if submitted to national authorities / database / repository)		
Intensity of the threat	*Important, potential, unknown*		
Data interval of the information included on that table	*From …to….*		
References (published and grey literature)	*references*		
Additional information or comments			

Existing threat	what we need	Bycatch by fishery (cetacean entangled)	Confidence in your information and expertise (high, moderate, low)
Species of cetacean impacted	*Name(s) and specify if impact is different for each species*		
Which kind of fisheries/gear	*Describe which type of fishery impact which species*		
Map of area where this threat occurs	*A polygon+ knowledge on confidence about boundaries and surface*		
On what was the polygon build on	*Type of data, interval of years and which years, methodology*		
Temporality of this threat	*all year long, only in summer,…*		
Data type existing on that threat	*(strandings, pictures, …)*		
Number of cetaceans impacted	*dead or injured per year or since…* *(summary + indication if submitted to national authorities / database / repository)*		
Intensity of the threat	*Important, potential, unknown*		
Data interval of the information included on that table	*From …to….*		
References (published and grey literature)	*references*		
Additional information or comments			

Existing threat	what we need	Interaction with fishery : Depredation	Confidence in your information and expertise (high, moderate, low)
Species of cetacean impacted	*Name(s) and specify if impact is different for each species*		
Which kind of fisheries/gear	*Describe which type of fishery impact which species*		
Map of area where this threat occurs	*A polygon+ knowledge on confidence about boundaries and surface*		
On what was the polygon build on	*Type of data, interval of years and which years, methodology*		
Temporality of this threat	*all year long, only in summer,…*		
Data type existing on that threat	*(strandings, pictures, …)*		
Number of cetaceans impacted	*dead or injured per year or since…* (summary + indication if submitted to national authorities / database / repository)		
Intensity of the threat	*Important, potential, unknown*		
Data interval of the information included on that table	*From …to….*		
References (published and grey literature)	*references*		
Additional information or comments			

Existing threat	what we need	Harassment (whale-watching only)	Confidence in your information and expertise (high, moderate, low)
Species of cetacean impacted	*Name(s) and specify if impact is different for each species*		
Map of area where this threat occurs	*A polygon+ knowledge on confidence about boundaries and surface*		
On what was the polygon build on	*Type of data, interval of years and which years, methodology*		
Temporality of this threat	*all year long, only in summer,…*		
Data type existing on that threat	*(strandings, pictures, …)*		
Number of cetaceans impacted	*dead or injured per year or since…* *(summary + indication if submitted to national authorities / database / repository)*		
Intensity of the threat	*Important, potential, unknown*		
Data interval of the information included on that table	*From …to….*		
References (published and grey literature)	*references*		
Additional information or comments			

Existing threat	what we need	Harassment (all types, apart whale-watching)	Confidence in your information and expertise (high, moderate, low)
Species of cetacean impacted	*Name(s) and specify if impact is different for each species*		
Which kind of vessels/human activities	*Describe which type of vessels or activity impact which species*		
Map of area where this threat occurs	*A polygon+ knowledge on confidence about boundaries and surface*		
On what was the polygon build on	*Type of data, interval of years and which years, methodology*		
Temporality of this threat	*all year long, only in summer,…*		
Data type existing on that threat	*(strandings, pictures, …)*		
Number of cetaceans impacted	*dead or injured per year or since…* (summary + indication if submitted to national authorities / database / repository)		
Intensity of the threat	*Important, potential, unknown*		
Data interval of the information included on that table	*From …to….*		
References (published and grey literature)	*references*		
Additional information or comments			

Appendix 7: Guidance document for expert's knowledge gathering

GUIDANCE DOCUMENT

Regarding the contribution and update of the GIS layer of "expert's knowledge" of ACCOBAMS for the CCH process

ACCOBAMS experts are invited to take part to the effort of mapping threats and address the following issues in the Mediterranean Sea and in other areas:
- describe direct threats on cetacean species in specific areas;
- draw areas (in GIS format) where direct threats occur
- give an information about confidence of your input

The direct threats considered here are:
- ship strike
- bycatch
- harassment whale-watching (ww)
- harassment pleasure boating or recreational activities (pb)
- depredation

This guidance document will help contributors of the GIS layer.

Experts are requested to send:
- the **polygons** if possible as GIS shapefile with the associated attribute table for each area (use the template_threat.shp). See below the explanations and rules to proceed.
- the associated **filled questionnaire (see file "EN_Questionnaire ACCOBAMS for Threats CCH2022.doc")**

For the polygons of "threats" in GIS format

Note: GIS is strongly required. But if GIS is not possible, then send a google earth file or an excel table with the coordinates of the points of the polygon, or even a drawing on a paper map that you scan and send through email. Please, send also the following table filled for each area.

1) Explanations for the attribute table of the template_threat.shp

Find here the explanations on how to fill the information contained in the associated attribute table of the shape:

id	Threat	Species	Area	Intensity	Season	Ref	Country	Gear type	Confidence
Automatic filling, don't write anything here	Specify **only one**: ship strike, depredation, bycatch, harassment WW* or harassment pb*	Initials of latin name of the species **only one** *(Tt for **T**ursiops **t**runcatus)*	Give the name of the area of the polygon	Important, potential or unknown	Give the month(s), or season(s), or put year if no high variation in time	Your name	The country of the area	Specify for bycatch and depredation	High Medium Low Unknown

(*WW= whale-watching

*pb = pleasure boating, recreational activities)

3) Definitions concerning the "intensity" column:

- **important**: A large proportion of the population is impacted, *or* the impact is frequent and often *or* it occurs in a broad part of the home range.
- **potential**: 1) some evidence is present but is only anecdotal or from un-quantified local knowledge or 2) considering the human activities and the cetaceans present in the same area, an impact could occur, but there is no study/knowledge for this area
- **unknow**

3) Rules for the creation of polygons:

3.1) One polygon = One threat and one species and one area

3.2) different area = different polygons, even if threat or species are the same (ex.: harassment WW for Tt for France => one polygon for the continental coast and another polygon around Corsica Island coast)

3.3) feel free if you have precise areas for each threat, each species or each gear types, to provide accordingly as much as polygon as you can

> # Tutorial to deal with the template_threat.shp
> # in QGIS (as an example)

To open the template_threat shapefile (.shp, .tab) by a click on the   button:

A window opens, leave default check file and system encoding. Brows to find the template on your computer. By default, Qgis recognizes files in .shp, selected the layer (s) you want to open and click on open (twice).
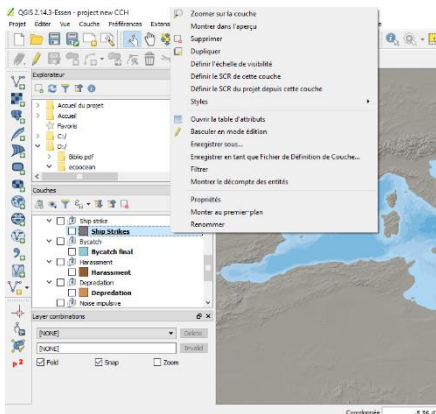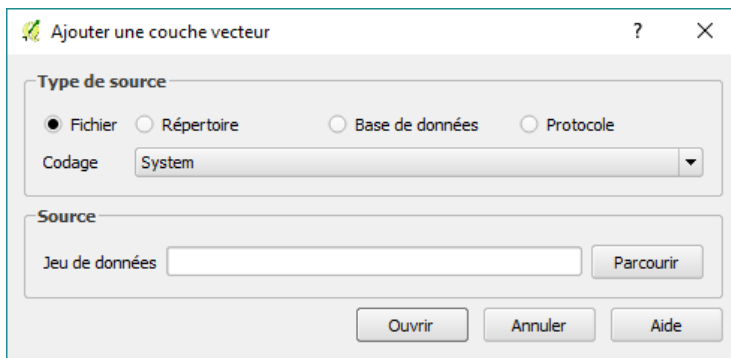
The shape appears in your left box, and in order **to modify** it (to add entities on the map of to fill the attribute table), you shall click right and select « toggle editing »

**To add entities to your shape**, that is to create a polygon, click on the icon « add a polygon »

You will see a cross on the map, it is your « mouse ». Click left to begin to place the first node/vertex of your polygon, and continue to draw the entire polygon.

To finalise the polygon, click right (wherever you want)

Then the attribute table window appears: fill the columns with the informations needed for each area and click on OK.
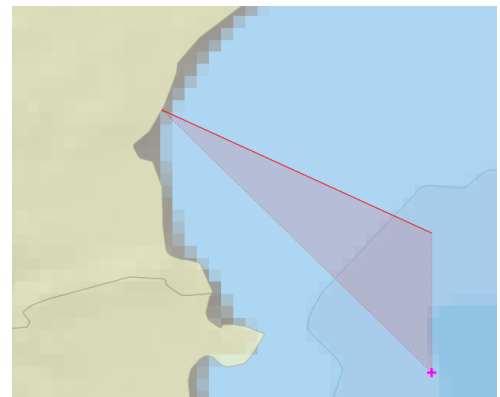
To duplicate a polygon:

➤ Select the polygon
➤ Open the attribute table
➤ Click on the icons "copy/paste"

After that you just need to modify the information in the table so that in your "pasted" polygon you get the new information on the species, threats, etc.

➤ Save the layer in .shp format (this allows you to make changes to the layer directly from Qgis):
  o Right click on the layer and choose "save as" in the list
  o Give it a new name (ex: Country_threat_area_yourname.shp)

Send for each polygon, the 5 associated files (.shp, .shx, .dbf, .qpj, .prj)

V. PROPOSED TERMS OF REFERENCE FOR A WORKING GROUP ON DATA AND MAPS FOR THE CCH PROCESS

Background information

According to the ACCOBAMS Conservation Plan (Annex 2 of the Agreement), Parties shall endeavour to establish and manage specially protected areas corresponding to the areas which serve as habitat of cetaceans. The concept of Cetacean Critical Habitat logically includes a combination of cetacean occurrence and/or favourable habitat and actual and/or potential threats that may result in problems at the population level. The ACCOBAMS Scientific Committee had already identified a number of important areas for cetaceans in the region in 2010 e.g., see the Annex to Resolution 4.15, but those need urgently to be updated in the light of new available knowledge. The Resolution has also indicated that an important tool to achieve good conservation status for cetaceans in the region is the creation of a network of effective - with targeted and fully implemented conservation measures - marine protected areas (MPAs). ACCOBAMS is also working on the development of conservation and management actions in the context of Conservation Management Plans (CMPs, SC14.Docs 15-18). Given data at an appropriate geographical and temporal scale are available, spatial mapping (e.g., see progress with NETCCOBAMS, SC14.Doc 36) is an important tool in identifying critical habitats for cetaceans known as CCHs (e.g. see Resolution 6.24) by incorporating data on both cetaceans and potential threats.

Since that Resolution, the Scientific Committee has received progress reports on work to develop updated CCHs (SC14.Doc35) and has also received the results of the ACCOBAMS Survey Initiative and a subsequent workshop examining the management and conservation implications (SC14.Inf03).

Both MoP Resolutions also highlighted the importance of a collaborative approach with other relevant bodies including the Pelagos Sanctuary, GFCM, IUCN-Med, UNEP/MAP through SPA/RAC, Black Sea Commission and in collaboration with MedPAN.

CCH are meant to provide a synoptic view of areas under various threats, actual or potential, within the whole agreement area. Once the CCH 'envelopes' are completed, the next step is to suggest effective conservation measures on a case-by-case basis. This will require a more focussed analysis by appropriate experts in consultation with stakeholders at the appropriate geographic scale.

The CCH process is linked and complementary with several other ACCOBAMS initiatives, including CMPs, ASI recommendations and other large-scale initiatives: e.g., IMMAs, EU Marine Spatial Planning, EBSAs, etc.

This working group is intended to allow a full review of relevant data and existing results (as maps) that could be integrated as layers into the CCH process and updates.

Objectives of the Working group

(1) Review the relevant sources of data, access and availability considering human activities at sea such as:

- maritime traffic through A.I.S,

- fisheries through A.IS. or VMS

- whale-watching in link with the ACCOBAMS WW WG

- recreational activities

(2) Liaise with the Duke Marine Lab. initiative about surface density modelisation for the Mediterranean Sea and Black Sea

(3) Review the best metrics to use considering the CCH aim.

(4) Examine the technical and administrative process in order to update regularly the human activities and species layers

Draft list of participants

- Léa David – leader/organizer (CCH, Vice-chair of the ACCOBAMS SC)
- Simone Panigada (CMPs, IMMAs, ASI, Chair of the ACCOBAMS SC)
- Greg Donovan (CMPs, cetacean distribution and density, modelling, management)
- Alessio Maglio (SINAY, noise, Netccobams, A.I.S, modelisation)
- Aurélie Moulins (CIMA Foundation, WW WG, A.I.S, GIS)
- GFCM representative
- Ana Cañadas (spatial modelling of cetaceans, Duke Marine Lab., modelisation)
- Lobna Ben Nakhla (RAC/SPA)
- MSPMed & SIMwestmed projects (modelisation, GIS)
- …